JRC Scientific and Technical Reports

# Consumer Perception studies on the safety of food packaging

## Final report of WP7 of the EU Project "Foodmigrosure" QLK1-CT2002-2390

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# Executive summary

The project FOODMIGROSURE aims to provide a novel and economic tool for estimation of consumer exposure to chemicals migrating from food contact plastic materials. The tool should be a physico-chemical migration model that describes mathematically the migration processes from plastics into actual foodstuffs under any actual contact conditions.

As the computational migration model is a tool of increasing importance for reasons ranging from legal (e.g. 2002/72/Ec allowing use of such models), the project included a work package (workpackage 7, WP7) to investigate the social acceptance of migration modelling versus chemical measurements, and its implications for exposure estimation by carrying out a consumer questionnaire and involvement of consumer protection representatives.

This posed a number of challenges. Often projects involve end user opinion and in this case food professional would be the target. However in WP7 a more comprehensive approach was taken to include not only stakeholders but also citizens (as consumers) themselves. The particular challenge in this case was that no project on risk perception or communication had ever before included packaging, and neither did the most recent Eurobarometer polling large scale study on risk perception performed by the European Food Safety Authority (EFSA) published in February 2006. Another challenge was the inherent complexity of the topic since food packaging is not perceived as source of risk, so the work

package would have to be developed with a first and foremost part on communication of science and communication of risk, which added in itself an additional scope. The third challenge was the inherent complexity of the questions raised : migration modelling to simulate migration, Indeed, the project FOODMIGROSURE is also more complex than simply the safety context of food packaging (e.g. regulations, testing, compliance etc) since it was to specifically audit the attitude towards modelling. The topic was found to be confusing even to risk perception experts.

The first phase of the Work package was a review of literature to identify experts and existing state of the art in the field (developed in Chapter 1).

In a second phase, a brainstorm was then organised by invitation of a selection of the most relevant experts in the field (Chapter 2). Experts received in advance materials describing the project FOODMIGROSURE, ideas of potential type of issues to address for focus group and visual stimuli for the discussion; a small brochure on simple explanations was developed, and a draft of example questionnaire was also developed as base material for the brainstorm; The brainstorm allowed to identify the prioritisation of the options; where the first one would be a focus group (qualitative approach), and quantitative approach could be attempted with questionnaires with a large polling base, and there could be also technical questionnaires for qualitative impressions from stakeholders.

The third phase consisted in the development and deployment of a focus group. The basis was the expertise gathered in a former EU project

"TRUST" QLK1-CT-2002-02343 "Food risk communication and consumer's trust in the supply chain". This project was focused on the "evaluation strategies brought about consumer to assess the reliability of the message, the way they process risk information with regards to different food hazards, and the cultural gaps between professional risk managers and laypeople". The main expert responsible for the work package on focus groups was located in Italy and a collaboration was developed to conduct such focus groups. Protocols were developed and the focus group took place in June 2006.

In parallel, attention was given to the recently published Eurobarometer survey on risk perception from EFSA. Although materials in contact with foods were not treated as part of the many food issues in the polling, the basic questionnaire provided a good base to include such issue in a new poling venue. We developed a specific questionnaire based on the one used by EFSA and questions raised in the EU TRUST project, and checked both with the focus group experts and with consumer associations' experts.

As polling venue, we decided to take advantage of a pioneering event in public participation; which a foreseen "open-day" to the JRC where about 2,500 visitors were expected (May 2006).

As this type of initiative had never been attempted before, we first researched expertise in science communication to the non-scientist, where we first got a course and brainstorm on how to organise the part of science communication to the non scientist. The outcome of the brainstorm was to take an approach of polling more suited to the event

which included other key goals such as science communication and exemplified JRC work in the field. Because of the number of visitors needed to poll and the increasing complexity of the polling topic (modelling) as well as fast pace of visitors and limited time span per visit and polling, it was decided to develop a video which would retain neutral characteristics but would have an entertaining quality, followed by a rapid tour of the laboratory that would recall the concepts testing to modelling, followed by the compilation of a questionnaire on the information received.

Simultaneously, contacts were established with consumer associations, in order to investigate reaching consumers via their associative role as well as to study approaches on how to do so.

A test trial was run on consumer associations with 35 representatives of the Lombardia region. The experiment was then conducted on citizens in full scale during the JRC Open Day where the event also involved the presence of the consumer association representatives. Questionnaires and comments were colleted for 700 units which represented about 1400 visitors to the food contact activities.

In the last phase, more specific technical questionnaire was directed to end-user of modelling, which was mailed to a variety of stakeholders such as National Reference Laboratories, commercial laboratories, industries, EFSA, CEN members etc. About 30 questionnaires were received back with enough answers to form a summary.

Globally, people in the overwhelming majority -both for the questionnaire approach and for the focus group approach- felt reassured regarding the safety of packaging simply from the fact that they did not previously know that such research and controls existed. Many citizen also clearly expressed the wish to have this type of research much more visible at the level of both consumer associations and consumers themselves.

The responses were echoing quite interestingly between the different approaches directed at consumers/citizens. Although obtained by completely different methodologies, both focus groups and quantitative citizen polling questionnaires showed many similarities even in the specifics. There is a fundamental trust from the public in the scientists to distinguish and understand safety issues. The consumer wants sincerely to be approached and informed by scientists for this reason and is also ready to favour new approaches such as migration modelling if it can be an additional tool for better consumer protection. The benefits of packaging are recognised, and the presence of migrants is considered similarly to the presence of food additives in foods. Modelling is viewed as a additional helping tool to assist the scientist as first and foremost raison d'être, and was found to have its strongest value as pointing the worst cases that could occur. The consumers or citizens made no mention of environmental or worker health effects benefits.

However, the consumer especially in the context of the focus group remarked justly that one needs to be sure that at the root for use of these models are experimental data which demonstrate the applicability of the model.

In the case of stakeholders, that is where the most caution was found on the practical application of modelling. Mostly the gap in this area is the in-depth explanation or teaching of why when and how to use modelling in practical situations, as well as have clear boundaries on when it is safe to consider modelling for compliance or enforcement purposes and when modelling must be also accompanied by laboratory data. The project therefore highlighted the importance of the past and current initiative by the EC-Joint Research Centre (EC-JRC) in the past to provide courses on migration modelling, as well as by the Community Reference Laboratory to keep organising specific trainings related to migration modelling aspects.

Finally, in the polling design, the initiative involving the development and realisation of the short movie also raised many positive comments on the humanity and added-value the initiative represented for the consumer's understanding of science. This shows that there is a gap to fill in the area of science communication and safety issue communication with means developed with the citizen in mind.

This workpackage, beyond its positive results in terms of consumer acceptance to modelling, also experimented approaches and a pioneering activity is experience as part of the project FOODMIGROSURE, which can have valuable repercussion on the TIP.

This part also creates new ties to the Risk Communication (planned) activities of EFSA and can be another impact of the project, as well as on the grown area of local impact of institutions and science

communication of the public at large and public participation mechanisms.

# Introduction and Strategy

The project FOODMIGROSURE aims to provide a novel and economic tool for estimation of consumer exposure to chemicals migrating from food contact plastic materials. The tool should be a physico-chemical migration model that describes mathematically the migration processes from plastics into actual foodstuffs under any actual contact conditions.

As the computational migration model is a tool of increasing importance for reasons ranging from legal (e.g. 2002/72/Ec allowing use of such models), the project included a work package (workpackage 7, WP7) to investigate the social acceptance of migration modelling versus chemical measurements, and its implications for exposure estimation by carrying out a consumer questionnaire and involvement of consumer protection representatives.

This posed a number of challenges since packaging is not perceived as a source of risk. Often projects involve end user opinion and in this case food professional would be the target. However in WP7 the first and part of the second year was to discuss if and how to approach a target audience being the consumers as citizens themselves. The particular challenge in this case was that no project on risk perception or communication had ever before included packaging, and neither did the

most recent Eurobarometer polling large scale study on risk perception performed by the European Food Safety Authority (EFSA) published in February 2006. Another specific complexity was that food packaging is not perceived as source of risk, so the package would have to be developed with a first and foremost part on communication of science and communication of risk, which added in itself an additional scope.

The topic of the project FOODMIGROSURE is also more complex than simply the safety context of food packaging (e.g. regulations, testing, compliance etc) since it was to specifically audit the attitude towards modelling. The topic was found to be confusing even to risk perception experts.

For a better understanding, in the project second year a literary review was finalised to identify the state of the art and to find any correlation with existing projects related to consumer attitude, confidence, risk perception and communication within the field of food safety.

This allowed to identify the exponential growth of large EU projects targeting the area of risk perception and communication dealing specifically with food safety. It also allowed to identify major experts participants in these projects to contact for advice on approaching such issue rather than the original technical annex of a simple polling by a consumer survey institute. In this case it became clear from the initial contacts that the topic could not be treated as simple polling and that even in the expert area, specific methodologies are still in development on a case by case basis, as they are not simply transferable from topic to topic in the area of food safety.

The development of the WP therefore was articulated around the following axes:

- Background familiarisation with the topic of risk perception, consumer attitudes, social and behavioural science, including approaches, by literature review (section 1)
- Identification of potential conceptual approaches, by brainstorming with experts, definition of target audience(s), and further investigation of conceptual approaches (section 2)
- Qualitative citizen data by Focus group approach (section 3)
- Quantitative citizen data by questionnaire approach (section 4)
- Qualitative End-user data by questionnaire approach (section 5)

# Phase 1:
# Review of background and literature review

## Introduction

Although consumer attitude to risks related to food safety or food topics is not new, it is obvious that the past few years have seen a large increase in financed projects in that domain. Indeed food scares have shaken consumer confidence and lack of transparency in some cases has undermined restoring that confidence. The creation of the European Food Safety Authority has been in part to respond to that need, and many EU countries and abroad have also created their own agencies at the national level. Many projects currently on-going deal with either acceptance of new products/technologies, trust, food safety, risk communication and risk perception. Even more recently the research has been extended to communication and perception of risk from chemicals in products. All projects have in common the fact that methodologies are found to be non-transferable from one topic to the next and thus that both models and methodologies have to be redeveloped and defined for each new topic. Due to the fact that the topic is difficult and requires a certain educational level, the work to be done was quickly realised as quite different than a normal case scenario of market /consumer research.

The main challenge that was identified along WP7 preliminary discussion in year 1 was the definition of the recipient of the survey, which impacted directly the difficulty of the questionnaire or study design. In year 1, the consensus had been that because of the complexity of the topic, having the citizen as a recipient would not be so relevant because packaging has never been introduced as a source of risk, and lacked in interest to be forced into a safety issue. Also it was considered that the consumer

was not most likely the end –user, i.e. the entities that would have to use and or to trust results provided by such techniques in risk decisions. The primary target were defined as enforcement laboratories since they must emit a judgement on the validity of such predictive data in their role in ensuring consumer safety for the Health ministries of their respective Member States, as well as EFSA for risk assessment purposes. Producing industries (directly or via their professional organisations), especially converters on which the burden of compliance is often placed, would be included as well as food industries which must also trust these new methods in their risk management policies. Finally consumer organisations would be represented as final link to the citizen.

However after further discussions with some experts it became clear that the WP7 of the project FOODMIGROSURE also presented a new concept compared to most works in progress in the sense that it implied introducing the concept of risk in an area that has never been associated with risk in any preceding studies. Unlike all other studies, there was no product being presented (as in some EU projects such as e.g. Actipack, organic food) or technological risk being evaluated (e.g. food irradiation); It also appeared that the topic could appear confusing even to risk perception experts, therefore the concepts from other studies were not really applicable and need to be revisited and better understood.

The first step was to develop an understanding of the latest development in the field as the past 3 years had witnessed an explosion in the number of projects related to consumer attitude, confidence, risk perception and risk communication. This step represented a prerequisite to identify specific types of expertise necessary to carry out the study, rather than

the previously thought simple consumer type study by a consumer /polling institute. It was also a pre-requisite to develop an understanding in order to be able to interface efficiently the scientific aspects and consumer aspects and experts, and to develop presentation materials best suited to introduce the topic in stepwise and lay terms. It was also important towards understanding the differences and potential transfer of concepts (or lack of) between different types of topics in the area of risk communication, influence on perception and acceptance.

The specific tasks undertaken are summarised below

- Thorough review of the state of the art and latest developments in the area of risk perception and related studies.
- Current international and EU projects to benefit from
- Sources of expertise in the field
- Theories applied to consumer attitudes in risk perception
- Approaches used
- Latest publications to topics at the forefront
- Development of draft of presentation or introduction (either in focus groups, or as prelude to polling).
- Development of draft of a type of concepts for questions

## Review of literature and state of the art

A literature review was conducted to identify the state of the art, and current EU projects related to the field were identified and reviewed to establish various scientific fields involved and sources of expertise also specifically related to the area of food.

Although consumer attitude to risks related to food safety or food topics is not new, it is obvious that the past few years have seen a large increase in financed projects in that domain.

Risk perception can play a critical role in the daily behaviour of humans, and needs to be considered for developing effective risk communication.

It has been well explained in simple terms most recently (Patricia Nance, In press, for second edition (2005) of the ENCYCLOPEDIA OF TOXICOLOGY, Academic Press, Oxford).

> *"Risk perception is the apprehension or opinion of the likelihood of risk(s) associated with performing a certain activity or living a certain lifestyle. Many factors play a role in perception of risk. Some of these factors are personal experience with the risk, perceived importance of the risk, the credibility of the communicator and their organisation, and the language and presentation format. Each individual has their own way of thinking and decision making ability, which can make risk communication a challenge. Dramatic and memorable risks are less acceptable than uninteresting and forgettable ones. The factors that make a risk dramatic and memorable, such as the airline crashes, may distort risk perceptions. Events that are highly publicised in the media become well*

*remembered and appear to have happened more frequently than normal, hence creating a larger perceived risk.*

*Familiarity with a risk also skews the perception. Unfamiliar risks are not as acceptable and tend to be perceived to be as higher risks than familiar ones. The public tends to overestimate the risks of seldom occurring events and underestimate the risks of common, everyday risks. For example, the perceived risk of being in an automobile crash is perceived to be low compared to the risk of being in an airplane crash. In an automobile, the individual has a feeling of control, which allows the individual to feel safer than in an airplane where someone else is in control.*

*Trust and accuracy are two very important factors in risk perception and risk communication. If the public does not trust the experts, the perceived level of risk may be high. To build this trust, accurate information must be given to the public. No potentially important information should be left out and the public should not perceive the experts as hiding the key facts. There are two basic situations when dealing with trust: high trust, low concern and low trust, high concern.*

*The awareness of the risk also plays a crucial role in risk perception. If the public lacks the knowledge to understand the risk, then the risk can be over or under estimated. Researchers have shown that experts and lay people are typically overconfident about their risk estimates. The role of experience is related to the knowledge of the risk. Individuals that have previous experience with the specific risk or those having a direct economic relationship to the risk usually have a more accurate perception of the risk. Experience does not mean that the individual must have personally been involved in the risk but has awareness of the risk's affects. Experience can also be influenced by the risk frequency. If an individual is exposed to a similar risk more frequently, it can create an overestimate of the risk due to the frequency of exposure.*

*There has been an increasing amount of research done in the area of risk*

*perception by a variety of fields, such as sociology, political science, psychology, anthropology and even geology. This research is leading to a better understanding of how individuals perceive a variety of risks in different situations. One expert (Paul Slovic) has stated, "Perhaps the most important message from this research is that there is wisdom as well as error in public attitudes and perceptions. Each side, expert and public, has something valid to contribute. Each side must respect the insights and intelligence of the other."*

When introducing a new topic in the area of risk perception, scientists must decide which channels to use for providing the necessary information to consumers. A study on the consumer attitudes towards oxygen absorbers in food packaging (Mikkola et al, 1997) already noted that

*"In recent studies it has been suggested that the social context or derivation of messages concerning potential hazards to society (e.g. genetic engineering) are likely to be as important as the information conveyed (Frewer and Shepherd 1994). While information about risk can be communicated through a variety of channels, public attitudes and reactions to the potential hazard may be dependent on the extent to which the source of the message is trusted by members of the public".*

Nevertheless the stated trust in risk information sources and actual reactions to information cannot be equated and most recent and current projects in the field concur to date that further investigation is still needed, as the relationship between information source and subsequent behaviour may be determined by interactions between information source, hazard characteristics and personal attributes of the receiver.

In this case the purpose of the study is the attitude towards a methodology to verify compliance with and enforce safety. Because of

the specificity of the topic there may be large differences due to level of familiarity.

The OECD Guidance Document on Risk Communication for Chemical Risk Management also explains the challenge and offers a number of guidelines:

The main challenges are (as more simply stated above)

- Unfamiliarity of the approaches used to assess risk posed by a product
- Difficulties to differentiate between the potentially dangerous properties of a substance (hazards) and the risk estimates that depend on both the properties of the substance, the exposure to humans, and the scenario of its uses (risk).
- Difficult to communicate non acute risks with adverse effects only over a long period of time, and possible synergies.
- Unfamiliarity with the regulatory and non-regulatory tools used for managing the risk posed by a product

The general guidance of the OECD document contains distinct steps to select an approach for specific purpose: These approaches can be brochures, public meetings, press releases, internet etc. The choice of the appropriate approach depends on (1) the stage of a risk management process in which the risk communication would occur, (2) the type of risk situation (i.e., from routine risks to those that have a high potential for controversy), and (3) the audience.

In the case of the project FOODMIGROSURE, mathematic modelling is allowed in 200/72/EC for some specific cases for which the method has been validated based on a large compilation of data in a 3 year research project.

In terms of stage of risk management, the risk issue stems from a legislative requirement and a previous government policy decision (2002/72/EC). It is therefore not a risk but an alternative route to risk prevention. The question is therefore whether it controls the risk within acceptable limits in comparison with classical methods.

In terms of the type of risk situation, it can be associated with "*Risks with high uncertainty"* since risks coming specifically from packaging are not readily known and may lead to consequences that are not fully understood in comparison to other risks.

Therefore it faces three major challenges of complexity, uncertainty, and the third one can be expressed as ambiguity.

This could also make the type of by otherwise classified as "*Risk with high potential for controversy"* triggering controversial or emotional responses, and potentially public outrage. The reason would be that people might feel involuntarily exposed to a risk of contamination from packaging of which they were entirely unaware, and communicating uncertainties of experimental laboratory approaches and computerised approaches may not reassure them in the least.

Finally the audience, between citizen and stakeholders would have very diverse levels of knowledge and consequently there are a variety of different requirements that are relevant to the design of any risk communication programmes in the context of the project. Moreover, audience needs may vary according to the type of risk situation as well as the various stages in the risk management process (are there examples in the press concerning packaging at the time of study, risk management different levels for different materials, for examples where monolayers are regulated but not multilayers). These different requirements make it necessary for the risk communicator to select the proper resources for different audiences, risk situations, and risk management stages.

The development of approaches for a topic like the acceptance of migration modelling as a complement to chemical experiments for the verification of compliance with limits set for substances in food contact materials has several specific intrinsic sources of complexity which must be considered, which can be further inferred from the analysis conducted in the previous paragraph:

- Packaging which is not normally associated as a source of risk;
- The exact nature of risk is not known
- The topic is unfamiliar
- It would be perceived as an imposed risk (rather than voluntary, as the individual has no choice)
- It would be perceived as under government control rather than individual, therefore uncontrollable

On the positive side, it has no catastrophic potential and may be perceived a fair in risk –benefit distribution, since packaging is first and foremost a source of protection.

These factors are important because commonalities between risks need to be addressed in such types of studies, as well as public values and acceptability, and risk management is ultimately an issue of social policy that requires decision be made on the basis of value choices. It has been recognised (Winter and Francis, 1997; Sandman, 1997) that the public pays little attention to hazard solely defined as the probability of an adverse outcome and are more affected by “outrage”, which can be defined rather like a non quantitative non biological attributes, while it is the opposite for experts, who pay more attention to “hazard” as defined by the probability of an adverse outcome.

As already touched upon above, the “outrage” factor may depend on whether the risk is voluntary, whether the risk and benefit are equitably distributed, whether the risk is from natural or synthetic sources, whether the risk is subject to individual control, and whether the risk is familiar or not. Several strategies for effective risk communication through acknowledgments of scientific and social risk factors need to be considered.

In addition, as the past years has seen new investigations in the field of risk perception in the area of release of chemicals from products both on the side a policy related requests by DG SANCO and as well as a Long Range Initiative by CEFIC under their Human Exposure Tiered Risk

Assessment (HETRA), consideration from the early recommendations from these studies were taken into consideration.

## Review of EU projects in the field as source of knowledge

The explosion of projects related to risk perception in the recent years (table 2) has also clearly shown that the approaches themselves have to be revisited, mostly at least tailored or redeveloped for each specific purposes, included the psychological models underlying the various consumer attitudes.

Indeed, consumer attitudes are mostly either directed to

- Products (active packaging, modified atmosphere packaging, organic foods etc)
- Perceived risks from technologies (GMOs, food irradiation)
- Food safety issues (pesticides, bacteria, mad cow disease etc.)

For the project FOODMIGROSURE, one phase implies –even though not a scope in itself- to educate –neutrally- the audience of the presence of a risk of release of substances form packaging and of the measures in place, i.e. of risk communication, which can be an entire field to itself; In the field of risk communication itself there is still also a number of studies showing the infancy of this field in the context of food safety, and much highlighted by the much negative impact of most of the past food scandals. Indeed the uniqueness about food safety in general is that

food is required for life, and food risks cannot be treated with concepts transferred from the nuclear and chemical sectors (EUFIC Quo Vadis food risk communication; EUFIC Forum No 1, August 2004). Yet most studies until recently had been based on the energy and environmental fields. Food is also unique and packaging as well since there may be food ethics dictating consumption and both for food and packaging as well may be a source of brand loyalty. Evolution in economy, regulatory, technological, scientific sanitary and sociological affect food preference and the perception of risk; one example dealing directly with packaging might be the preference for people to convenience as for example single portions and not being perceived a risk although there much more packaging for much smaller volumes (i.e. greater migration potential). A packed foods are taking greater importance in European societies and as such, food risk communication is not only an important concern but also poses unique challenges.

Common methods for communicating food chemical risks information have been characterised as one-way and technocratic (Winter and Francis, 1997). It has been recognised that efficient risk communication cannot just rely on a one way communication in which government leaders, industry, or regulatory agencies provide risk assessment and risk management information with the aim that the public accepts risk messages being conveyed and act accordingly. In addition, the project TRUSTINFOOD highlighted a fallout in trust in the regulators in the 1980 and 1990 throughout Europe due to a number of scandals (mad cow disease, dioxins in chicken feed etc); this led to the separation of risk management and risk assessment into independent bodies. The project also noted geographical variations where countries (e.g. Nordic) with transparent risk communication tools and little scandals exhibit greater

trust in their governments. On the whole the public also tends to trust more consumer organisations and experts (e.g. academia) rather than supermarkets, industries or politicians.

Effective risk communication requires communicators to recognise and overcome several obstacles that are rooted in the limitations of scientific risk assessment and in public understanding (Winter and Francis, 1997). According to the authors, these barriers include the need to make assumptions and subjective judgement in the risk assessment process as well as the disagreements among experts. It has also been highlighted (Slovic, 1986) that from a public standpoint, perceptions are not always that of the experts, and that risk information may frighten or frustrate the public, that strong belief are difficult to change, and that naïve views are easily manipulated by the method of presentation. One method is to compare risk information with other risks; it appears that comparisons are more meaningful to the public than absolute numbers or probabilities, particularly where absolute values are relatively limited. However, it has also been noted that direct comparison between different types of risks may ignore the different levels of uncertainty associated with each risk estimates, especially between low uncertainty risks such as motor accidents vs. low lifetime exposure to carcinogens in the diet, which may have different public values or acceptability of different types of risks.

This was also noted in all EU projects and EUFIC Forum, where all research currently funded highlight that methodologies for research on trust / acceptance/ attitude/ behaviour need to be more carefully

considered. The EUFIC clearly underlined that

> *"to ask questions on trust in situations in which people do not generally perceive a risk is to call into question a "taken from granted" of life. Many people may not have thought about trust in relation to food purchasing and so to ask a question […] may suggest that here are good reasons to withhold trust or to respond with stereotypical answers."*

Food safety rarely addresses packaging. The web site EUFIC (European Food Information Council) lists as food safety challenges, where the 6 main ones are microbiological contamination, mycotoxins, pesticides, antibiotics and growth promoters (hormones), Industrial pollution (dioxins, heavy metals), and bovine spongiform encephalopathy.

The overall non exhaustive bibliography in the field of consumer trust perception acceptance behaviour is presented at the end of this document.

The scientific fields underlying consumer trust perception acceptance behaviour are ideally extremely multidisciplinary in nature, ranging from psychological and psychometrical sciences (including now bioethics), cognitive science, social sciences (including consumer behaviour, sociology, agro and nutritional economics, marketing and communication, as shown by the recent financed EU project sin the field.

There have been more than 10 EU projects directly linked to consumer research and risk perception or food safety, for the most part since 2001.


FOOD
MICROSURE

| code | Name | coordinator |
|---|---|---|
| 1996 | Consumer attitudes and decision-making with regard to genetically engineered food products | MAPP Centre |
| QLK1-2001-00291 | TRUSTINFOOD A European Study of the Social and Institutional Conditions for the Production of Trust http://www.trustinfood.org/ | SIFO (FIN) |
| QLK1-2001-30067 | Consumer Consensus Workshops Bridging the gap between consumers and scientists http://www.consensusworkshops.org | BEUC (BE) |
| QLK1-2001-300164 | Exploring Costs and Benefits of HACCP - a pilot study in the dairy and meat products industry in the European union | TNO (NL) |
| QLK1-2001-300589 | RA_RM The interface between Risk Assessment and risk Management http://www.ra-rm.com/ | DIFVR (DK) |
| | TRUST. Food Risk Communication and Consumers' Trust in the Food Supply Chain http://www.trust.unifi.it | Univ. Florence (I) |
| | Consumer decision-making on organic products http://www.condor-organic.org/ | Univ. Surrey (UK) |
| | FOOD IN LATER LIFE http://www.foodinlaterlife.org/ | Univ. Surrey (UK) |
| Food-CT-2003-506820 | HEATOX http://www.heatox.org | Univ. Lund (SE) |
| Food-CT-2004-506446 | SAFEFOODS www.safefoods.nl | RIKILT (NL) |
| Food-CT-2003-50687 | NOFORISK http://www.noforisk.org/ | DIFVR (DK) WP6 - MAPP |
| | Science for Safe Food in Europe www.safeconsortium.org | INRA (FR) |
| SSA-510200-PERIAPT | PERIAPT - "Emerging Risks in feed and food supply chain http://www.periapt.net/default.aspx | VWA (NL) |
| FOOD-CT-2004-506319 | CASCADE – http://www.cascadenet.org/default.asp | Karolinska (SE) |

**Table 1: review of the current EU projects in the field of risk perception and consumer attitudes**


FOOD
MICROSURE

The table below summarises the study of each project and partners in these projects in order to establish a pool of adequate mixed experts that can provide the most breadth and in-depth view for input and deployment of WP7.

| Institution | MS | CONTACT PERSON | SPECIALTY | PROJECTS |
|---|---|---|---|---|
| The National Institute for Consumer Research (SIFO) | NO | Unni Kjaernes | Studies related to risk communication, | TRUSTINFOOD<br>TRUST |
| Royal Veterinary- and Agricultural University (KVL)<br>Research Department of Human Nutrition (FHE)<br>Centre for Bioethicsand Risk Assessment (CEBRA) | DK | Lotte Holm<br>Peter Sandoe<br>Jesper Lassen | Interdisciplinary research combining bio-ethics, social sciences and biologically based risk assessment. awareness within scientific research of its basic assumptions, value-judgements and uncertainties, and how these are perceived in society | TRUSTINFOOD<br>SAFEFOODS |
| Federal Research Centre for Nutrition and Food (BFEL)<br>Institute of Nutritional Economics and Sociology | DE | Corinna Willhöft<br>Erika Claupein<br>Jennifer Stiebel | Determinants for human food behaviour, development of menu planning systems and information and education of consumers, especially to evaluate the effectiveness of consumer education programmes. | TRUSTINFOOD<br>CONDOR<br>LATERLIFE |
| Food, Consumer Behaviour and Health Research Centre, University of Surrey, UK | UK | Richard Shepherd<br>Monique Raats | Researchers from psychology, nutrition and management in order to address issues concerned with food and consumer behaviour. | CONDOR<br>LATERLIFE<br>SENIOR QOL |
| MAPP (Centre for Research on Customer Relations in the Food Sector), Aarhus School of Business | DK | John Thogersen<br>Lone Bredahl<br>Carsten Stig Poulsen<br>Joachim Scholderer | Consumer food-related lifestyle and food choice, retailing and distribution, market-oriented product development, and competence building in food companies. | CONDOR<br><br><br>NOFORISK |
| INRAN (Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione) | I | Anna Saba<br>Marco Vassallo | Consumer studies aimed at assessing factors influencing food choice and dietary surveys. | CONDOR<br>LATERLIFE |
| Department of Public Health and Caring Sciences<br>Section of Caring Sciences, Uppsala Science Park | SE | Per-Olow Sjoden<br>Christina Fjellstrom<br>Birgitta Sidenvall | Peoples' food habits and dietary intake and how food, meals and food-related activities are organised, perceived, valued, and included in daily life among people in private and public households. | CONDOR<br>LATERLIFE |
| Università degli Studi di Firenze Dipartimento di Economia Agraria e delle Risorse Territoriali | I | Donato Romano<br>Gianluca Stefani | Food policy, economic aspects of food quality, Exploring the impacts of risk communication policies on welfare | TRUST |
| Università degli Studi di Trento Polo di Rovereto<br>Dipartimento di Scienze della Cognizione e della Formazione | I | Nicolao Bonini<br>Rino Rumiati<br>Lucia Savadori | Psychological aspects of consumer's trust in food risk information: judgement strategies; experimental protocols (psychology) | TRUST |

| | | | | |
|---|---|---|---|---|
| Wageningen Universiteit<br>Department of Social Sciences<br>Rural Sociology Group<br><br>Marketing and Consumer Behaviour Group | NL | Bettina Bock<br>Jo-An Wiersum<br>Lynn Frewer;<br>Judith Cornelisse<br>Ellen van Kleef<br>Filip CnucJde | Transformation processes in the countryside and the food supply chain; Attention for different levels (from local to supranational) at which these processes are shaped and for the different actors and institutions involved. | TRUST<br>SAFE FOODS |
| University of Reading; Department of Agriculture and Food Economics (UREADAE) Centre for Food Economics Research | UK | Bruce Traill<br>Mario Mazzocchi<br>Alexandra Lobb | Socio-economic determinants of trust in food risk information and management; design questionnaire and plan surveys, including for market segmentation analysis and causal models estimation. | TRUST |
| The University of Kiel<br>Institut für Agrarökonomie (UKIELAECAU) | DE | Claus Henniq Hanf<br>Andreas Boecker<br>Leef Dierks<br>Volker Saggau | Social interaction and trust in food risk communication; modelling of artificial agents who can replicate salient structural and behavioural characteristics (using consumer segments) | TRUST |
| Istituto di Sociologia Internazionale di Gorizia<br>Programma Emergenze di Massa | I | Bruna De Marchi<br>Luigi Pellizzoni<br>Susanna Greco | protocol for the sociological focus groups would be mainly specified by ISIG, in collaboration of UWAGRS, with the assistance of local partners for the identification of the relevant questions specific to each country. | TRUST |
| CREDOC (Research Centre for the Study and Monitoring of Living Standards) | F | Jean-Pierre Loisel<br>Agathe Couvreur | Analysing and forecasting behaviour patterns of consumers. Development of data systems, quantitative and qualitative surveys, marketing studies. Subjects related to food consumption and food behaviour, consumer's attitude to risk. | TRUST |
| DIALOGIK gmbH, Germany | DE | Ortwin Renn<br>Uwe Pfenning | Research patterns of communication and cooperation In the areas of high tension within the sectors of politics, economy and civil society. Analysing conditions and prerequisites for improving purposeful communication (such as institutionalised risk communication as an instrument of health protection) and for developing and initiating innovative procedures of participation and cooperation (such as citizen panels or mediations in environmental conflict situations) | SAFEFOODS |
| Agricultural University *of* Athens, Greece (AUA) | GR | George Chryssoichoidis<br>Thanassis Krystaliis | Marketing of agricultural and food products, with postgraduate training in new product development and strategic marketing for agricultural and food products | SAFEFOODS |
| Institute *of* Food Research (IFR) | UK | Gene Rowe<br>Jljlie Houghton | Safety and quality *of* food, relationships between diet and health, new options for the food industry through (biotechnology/molecular sciences) | SAFEFOODS |
| DLO RIKILT -Institute *of* Food Safety | NL | Harry Kuiper | Experience with dissemination and communication from previous EU projects. | SAFEFOODS |

**Table 2: summary of related EU projects and partners**

# Aspects of consumer behaviour

It is important to understand the vocabulary used to describe various aspects of cognitive and social science to interface properly scientific values with the risk perception aspects.

## *Attitude*

An attitude is a learned predisposition to behave in a consistently favourable or unfavourable manner with respect to a given object. It is thus a lasting general evaluation of something - it has knowledge of that something, liking or disliking, and the strength of the feelings. Attitudes are lasting, but changeable

They help to direct behaviour – e.g. do you recycle cans?

There are a variety of consumer attitudes such as attitudes toward product (e.g. boil in the bag), toward company (Philip Morris, Kraft) toward a retailer (Marks & Spencer), toward product attributes (e.g. salt content), toward various types of brand associations, logos – design, symbols – meanings, product endorsers – sports figures. In addition having a positive attitude toward a product does not necessarily translate into purchase and consumption (e.g. consumers may “think” that eating chicken and fish is good for their health, but may not eat these rather than red meat?

### *Beliefs: cognitive component of consumer attitude*

A consumer belief is a psychological association between a product or brand and an attribute or feature of that product or brand. Beliefs are cognitive (based on knowledge): the knowledge and perception that are acquired by a combination of direct experience with the attitude object and related information from various sources. The stronger the association of features or attributes with the product or brand, the stronger the consumer's belief.

### *Affect: emotive component of consumer attitude*

Purchase decisions are continually influenced by affect (affective response) the way in which we feel in response to marketplace stimuli. It is emotive rather than cognitive (beliefs) and is comprised of both our knowledge of stimuli and our evaluations of them. Affective responses can be very general or very specific. The affective component of attitude corresponds to theories and models attached to it: functional theory of attitude, the Fishbein model, and the belief-importance model

### *Intention: behaviour (conative) component of consumer attitude*

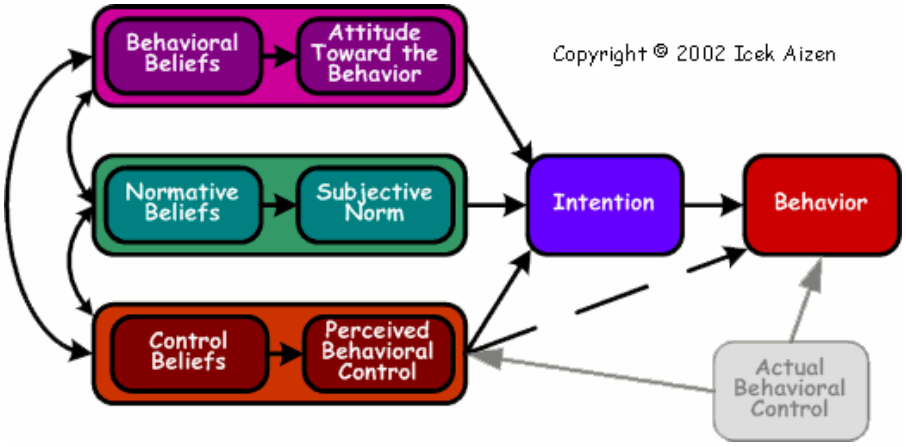
Affect is not closely linked to actual purchase. Behavioural intention—attitude toward brand purchase. A better predictor of behaviour than either beliefs or affective responses is Behavioural intention, which is the attitude toward brand purchase. It reflects the likelihood or tendency that an individual would undertake a specific action or behave in a particular way with regards to the attitude object. Behavioural intention models include the theory of reasoned action and the theory of trying.

## Theories and models in consumer behaviour

There are a number of models to consumer attitudes, beliefs and behaviour deriving from known theories; in some cases the models may not fit perfectly to each case and submodels must be developed;

### *Attitude models*

Some models are tricomponent (cognitive, affective, conative) or multiattribute such as the theory of reasoned action (originally developed by Fishbein). It is a comprehensive theory of the interrelationships among attitudes intentions and behaviour as illustrated in the figure below:




Source:
http://www.tcw.utwente.nl/theorieenoverzicht/Theory%20clusters/Interpersonal%20Communication%20and%20Relations/theory_planned_behavior.doc/ Adapted from: Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes,* 50, p. 179-211.

Subjective Norm refers to the perception of what other people think we should do with respect to a certain behaviour, and consists of normative beliefs: the perceived expectations that significant others think the consumer should or should not behave in a certain way, and the motivation to comply, which is the extent to which the consumer considers the possible opinions of significant others when forming an intent to purchase. Note: normative beliefs can include social and moral values.

The Theory of Reasoned Action can be applied to change intentions since it identifies those attributes most important in causing consumers to form positive (or negative) attitude, as well as identifies sources of social pressure and their possible role in intention formation.

This type of model has for example been further developed and tailored to explain consumers' attitudes to genetic engineering in food products in general by further differentiating between different types of outcome beliefs. Previous research shows that perceived benefits and perceived risks may have differential effects on consumer attitude. In addition, outcome beliefs may be differentiated with regard to different outcome groups. By outcome groups are meant groups or individuals that are likely to be believed by another person to be affected by the consequences of using genetic engineering in food production. Product-specific beliefs were not comprised in the model. Only beliefs relevant to the application of genetic engineering to food production in general were taken into account, and therefore only one attitude model was developed.

### *Behavioural intention model*

The behavioural intention model is based on Ajzen's theory of planned behaviour, which suggests three factors as determinants of individual consumer behaviour: attitude towards the behaviour, perceived social pressure with regard to the behaviour, and perceived control over the behaviour.

The theory of planned behaviour has been applied for example to explain consumer behaviour in relation to the purchase of genetically engineered food products, i.e. why some consumers would buy genetically engineered food products and why some would not.

One model can be integrated in the other to draw further conclusions such as the influence of reference groups on the behaviour of consumers for example as determinants of subjective norm, and possible obstacles to perceived control over the behaviour as determinants of that very factor.

### *Attitude change/information processing model*

This model considers possible ways of changing consumer through the development of a model based on attitude change/information processing theory. Based on experience with concrete products, but also on information from industry, governmental, and consumer policy sources it must be assumed that the attitudes would change.

The model can also be related to the others by also adopting an

approach linking attitude to cognitive structure, but in addition it concentrated on how consumers react to messages under varying conditions. The Elaboration Likelihood Model and Chaiken's heuristic model of persuasion provided major input for the model development.

## Review of potential methodologies

Measuring consumer attitudes can be done in a number of ways; Principally there are two different sets of instruments for conducting research on consumers. Both have their merits, advantages and disadvantages, they can be missed or used solely; in the end, it depends mostly on the research questions asked and the research approach adopted by the researcher. They can be qualitative (interpretivist) or quantitative (positivist).

A former EU project AIR CAT has distinguished the two as follows:

“Quantitative methods offer replicability, numerical data, an opportunity to statistical analysis, allow for comparisons between subgroups, tap individual responses and are less dependent on interviewer skills and orientation. These are used mostly when there is a starting hypothesis and a pre-set design, often to detect case and effect and analyse segregated aspects”.

"Qualitative approaches are open ended, dynamic, flexible, provide a depth of understanding tap consumer creativity, go beyond the rational or superficial approach and provide a rich source of ideas. These have a more flexible design and develop hypotheses along the way, want to described on-going processes, presents narrative and verbal data relies on the researcher to avoid bias and takes a more holistic view."

Qualitative approaches have been mostly used for consumer choice and beliefs (or a combination of both).

### *Observation*

This technique refers to looking at a consumer's behaviour in a given situation, comparing it with the behaviour of other consumers in the same circumstances and possibly finding a pattern that that provides hindsight on the issue considered. There can be either a "participant observation" in which the researcher is present and follows the consumer in the activity related to the topic of research, and may ask questions along the way about the consumer attitudes and choices; the drawback of the approach is the a strong influence of the researcher. Alternatively, there can be a non-participant study in which the consumer is unaware of being observed, which presents the risk of scarce information on the drivers to the consumer attitudes or behaviours.

### *Group discussions*

These do not follow highly specific rules; they usually include about eight to ten specifically chosen participants, have a duration of 1-2 hours and

are normally audio taped. Their success depends widely of the skills of the moderator, who has the task of both guiding the discussion and, observing the participant and interpreting their behaviour.

The group scenario offers the advantage of interaction among respondents. Casual atmosphere, more in depth look into attitudes and beliefs to dynamic discussions as well as tapping emotive aspects of behaviour. Possible problems associated with this technique are hostility among participant or with the moderator, dominant individual, or lack of focus in desired direction depending on the moderator. Shyness of participants, problem of memory.

### *Projective techniques*

These employ role playing to allow respondent to more actively participate and express themselves individually and then present their projections to the group.

### *Individual in-depth interview*

This type of technique is used when the topic may be personal, confidential. It is one to one, of about 1 hr, and there non-directive (no suggested answers). It is most used when interviewing professionals about key issues or to explore which issues are important to incorporate these into further studies.

### *Repertory grid*

It is a technique termed of qualitative elicitation it needs a set of identified elements (e.g. 4 packages) and some constructs (attributes) which defined the elements (colour sweetness etc); Participants then need to defined the attributes, possibly within a left and right pole (sweet to acidic for example), in order to yield more quantitative information this method can be modified for example using generalised procrusted analysis (PGC)

### *Laddering and means end chains*

Laddering typically looks for underlying reasons for engaging in a certain behaviour or for having a certain attitudes, It is used to identify relationships between consumers' attitudes, benefits and values concerning food and food issues (e.g. towards organic food and what the factors are that motivates it).

## Conclusions for the project

As far the audience was concerned the table below reports the possible types audiences that could be potentially considered within an attitude consumer study.

| | EXAMPLES |
|---|---|
| Risk management | SANCO, AGRI TRADE ENTR MS CA |
| Risk Assessment standpoint | EFSA, BfR, AFSSA, |
| Normalisation | CEN |
| Enforcement | NRLs |
| Contract Labs | PIRA TNO Neotron etc |
| Professional industrial associations | CEFIC< SEFEL etc |
| Consumer association | BEUC Eurocoop |
| Non-governmental organisations (NGO's) | ? |
| International authorities ?? | World health organisation?<br>Codex alimentarius?<br>U.S. Food and Drug Administration (FDA)? |
| Lay people | consumer |

**Table 3: potential targets for the study and examples**

A proposal for a lay term presentation of the topic is presented in Annex 1. This was prepared for presentation to experts in behavioural sciences. The text was aimed at lay terms to be used down to the consumer level if necessary; it was developed based on a number of descriptions in various literature as well as information websites. The presentation during focus groups must review various important concepts that are aimed at consumer attitudes related to packaging.

The topics were developed from a number of surveys in the area of food safety, irradiation, GMOs as well as the project TRUSTINFOOD and several references from the area of risk perception, including the more recent project TRUST; in addition the survey from the project ACTIPACK was also considered, although more in the field of packaging functionality and added value.

The themes that were thought to be tackled are summarised below:

| | |
|---|---|
| 1 | General attitudes towards packaging, especially food packaging<br>❖ Awareness of packaging functions/issues (protection, preservation, information, convenience, environment etc)<br>❖ Positive/negative aspects? (waste, energy vs protection?) |
| 2 | Awareness of Consumer Protection |
| 3 | Attitude towards methodologies for enforcement testing |
| 4 | Attitude towards uncertainty |
| 5 | Attitude towards modelling<br>❖ Understanding of scope of modelling (cost/ time saving, screening, estimation + checking exp. Results in some cases; i.e validation cross checking + reduction of uncertainty)<br>❖ Desire/need/benefit for such system (lab work, method development, >300 substances regulated)<br>❖ Reaction to their presence in food packaging legislation<br>❖ Reaction to their effects (cost, reduction of uncertainty)<br>❖ Benefits/concerns time, cost, environment<br>❖ Limits (need validation prior to use)<br>❖ Consideration of environmental issues – disposability, recyclability, less use of solvents. |

**Table 4: general themes to be tackled within the study**

# Phase 2:
# Expert brainstorm and preliminary work

We developed and utilised a platform of experts and how gave input on the brochure, comments on our explanations.

After review of the most important current projects in the field, we invited a selected number of experts to the JRC premises as a small initial task force. The number and list of experts contacted was not in any way exhaustive, but they reflected a basis of expertise and representation in projects that were relevant to the current one;

| Participant | Institute | Expertise |
|---|---|---|
| Richard Shepherd | (Univ. Surrey) | Condor; laterlife |
| Ortwinn Renn | (Dialogik) | Safefoods, europta; |
| Unni Kjaernes | (SIFO) | Trust in food; trust; |
| Lynn Frewer | (U. Wagenigen), | Safefoods; informall; RA-RM |
| Anna Jung | EUFIC | safefoods |
| De Marchi Bruna | ISIG | trust; foresight |

**Table 5: experts contacted for a brainstorm**

We also requested of further names that would have relevant experience. The experts were given choice of dates, and given some materials as an introduction of the project that described also some of the aspects that created difficulties or particularities, our current state of understanding of risk perception on that topic seen from the scientific side. All materials were expressed in lay terms as much as possible.

It was requested of the experts to review the documents and (e.g. presentation and guidance moderator draft for focus groups as well as of a potential questionnaire).

We requested that the discussion points should be linked to our current project FOODMIGROSURE and include the following specific points:

- Approach
- Presentation of topic to an audience: advice on the example prepared
- Who is the audience in other projects? Does it cover more levels of familiarity? Does the approach change as a function of the audience? Are the questions also different?.

The summary of the phase 1 and deliverables are presented in Annex 1.

The results of the brainstorm indicated that a focus group would be one approach that would have to be attempted, at least as a prototype initiative as no consumer attitude project had ever considered packaging specifically within the field of food safety.

Some of the items of the brainstorm are also included below:

- If the discussion with a focus group begins with a presentation, it could be dangerous because increase risk consciousness and the results could be biased in that respect.
- It is necessary differentiate several steps. First of all it is important increase the familiarity with the topic and increase people's interest without underlining immediately the risk aspects.
- It could be useful to begin with an explorative phase and then use a focus group.

- The selection of a focus group is very important and maybe it would be better to choose not only consumer but food safety experts as well. Do not expect much from the consumer from such a topic.
- People are used to think about packaging as functional device to protect food it is important to be careful introducing risk. It could be useful to compare food packaging related risk with other risks to investigate its relative consumer perception.
- It is useful introduce in a questionnaire if any questions not related with food safety to avoid the risk overestimation.
- Distinction between individual risk (smoking) and a systemic one (terrorist attack, health). Is packaging a systemic risk or individual one? systemic risk. We need to look at analytical dimension of the risk.
- It is a good option to begin the discussion with general question about packaging and its use to obtain a spontaneous evaluation from consumer and to investigate their relation with packaging and their awareness of it. After a preliminary introduction, introduce the risk concept. It is useful give them some examples to link with their daily experience. Some questions could be:
    - What do you think about packaging? [e.g. milk – or choose an example showing a sample]
    - Which do you prefer, Tetra Pak or glass? Why? Why are there so many types of packaging? What do you think about it? This approach links the citizens indirectly with a possible risk in the focus group discussion.

A specific discussion was then held on selection of a focus group; points and remarks included:

- It is better choose homogeneous group, same educational level, group of ten people, five male and five female that possibly respect demographic scenery. 8 persons also adequate (less people more time to discuss)
- No longer than two hours. In a max of 2hrs for a focus group, the budget of minutes must be well distributed between the different questions (few) and participations from all individuals.
- Audio and Video technical support is suggested with focused group.
- One or two moderators. Better to have 3 people so 2 can take notes;
- Select 5 or 6 main questions to reflect on different aspects.
- Recruitments of people using journal advertisement are not suggested it is better a network in the work place where there are people with different employment. (Three levels: me, people I know and people they friends).
- Differentiate between eaters and shoppers, male female etc group must balanced.
- Notion of STIMULI: All that can help people to speak and make associations and take part actively at the discussion (packages materials, pictures). For example, it can be possible to speak about microwave containers to guide them until possible risk source is naturally expressed by participants. Or by showing a lasagna tray.

- It might be difficult to avoid all some environmental safety connections, due to the nature of many materials used for packaging, in particular plastics polymers.
- In the middle of this general discussion it is possible introduce computer simulation and test to investigate food packaging safety to avoid to influence their opinion.

Other possible questions were:

- Who do you think takes care of your safety? Or do you feel informed on safety of foods
- Who do you think has responsibility of packaging (e.g. supermarket, consumer, industry, government)
- Do you trust in institutions?

The flow of discussion (conceptually) would go: from Ideas/beliefs to risk/benefits to methodology (testing) and likely back to protection of the consumer.

Practically, some ideas could be for question leads to direct the discussion:

- Introduction: package is a bought everyday (daily action); Protection type of question:
- Do you think there can be an interaction between the package and the food
- If answer is NO => show plastics (e.g. bottle of water with best by date, or can)
- Do you think scientists and government look at safety

- Do you have any idea on how packaging is tested for safety in the lab; is it of importance to you?

If and when a presentation is made on the modelling (as illustration), it is probably better to introduce someone else than the moderator, (e.g. a scientific colleague) for the part on showing the experiment or the demo of modelling.

It was found better to show a little presentation to introduce the group to test procedure and computer simulation with a real example in a very simple and clear way because citizen would not be generally competent to understand and judge modelling. It would useful compare data from computer simulation and experimental ones for example.

The discussion then also turned to the impact of number and geographical location of focus groups. If several focus groups are foreseen, it was considered, that generally speaking better to organize more focus group in one country then individual focus group in different countries. The reason is that one focus group per country may not reach saturation (i.e. the discussion and answers given may be unique to that group rather than country. However, due to the elevated costs of focus groups coming from the complexity and time –consuming nature of data analysis, it was also considered to consider the project FOODMIGROSURE as pilot study and simply develop and deploy a good prototype protocols for further use in other projects. The countries were then discussed; usually most used countries are UK, DE or FR, a Nordic one, ES/I and now probably new MS; IN the case of packaging one option is to base the choice on the occurrence of packaged food

*highest convenience oriented country" to lowest; in this case it would be very natural to retain 2 countries such as the UK and a Southern One (Italy or Spain); In the worst case, the most reluctance would be a more traditional oriented and lack of trust in institutions, so Italy would be a good test case.

The analyses of results were then discussed. It was warned that the analysis of results takes much time (typically 2-3 man-month) and can be very complex. Typically, the text and its structure must be analysed using customised software. This software is able to account for how many times a specific word appears in the text (based on specific written transcripts of audio analysis of all discussion of focus group that have been recorded) and what is its connotation positive or negative.

Because of this amount of work it is again suggested to reduce the number of the Member States involved in this study and choose the most representative one considering packaging and modelling issues.

The recruiting was also discussed. A recruiting agency can be used: they have sources of names to use a subjects for polling: there is a cost associated to its use.

Work staff can be used to recruit participant with a snowball effect (e.g. three generations = 3 levels as outlined before) $\Rightarrow$ This is a less costly solution, as long as attention must be paid that the final people do not know the interviewers and do not know each other.

It was advised to not recruiting children and teenagers, as they are not relevant for these purpose (modelling); housewives may be more relevant.

A final brainstorm considered again some potential specific questions.

- What do you think packaging does?
- Do you think sometimes packaging can have effects on food different from its protection? OR
- Do you think packaging could have effects on food? OR
- Do you have Doubts or questions concerns packaging? OR
- Do you think that long time packaging has effects on the quality of food? (Ex. Water bottles expired data)
  OR
- Why there is an expiry date? Is it referred to packaging? OR
- Show examples: e.g. hot coffee and plastic cup material to introduce gradually risk topic

After the risk is introduced:

- Do you know how the safety is controlled?
- Do you have any ideas how scientist test packaging for safety?
- What kind of information would you have to insure your safety?
- How do you think experts [scientist and government ] check your safety?
- Do you feel sure about this testing procedure?
- Do you think scientist and government check safety?

Other types of possible questions:

- Why we have to prefer computer simulation instead of experimental test?
- Do you think it is enough to assure food-packaging safety?
- What more could be done?

Another option was to let discussion go on after the presentation!! What do you think about it? (maybe this is the simplest way)

The conclusions were therefore to develop a protocol based on the ideas developed here, and to have a test in Italy, with professional moderators. Several names were mentioned and the TRUST project co-ordination of the focus group protocol led by ISIG and Dr. de Marchi was afterwards found to be a compromise that would maximise the expertise and the language problem to conduct and experimental focus group in Italy.

# Phase 3:
# Qualitative approach by Focus group

Acknowledgements and note on the authors:
This phase was developed, conducted and reported in this chapter by experts in the area of consumer perception and behavioural studies, Bruna de Marchi and Luigi Pellizoni. Their long demonstrated expertise in protocols and conducting focus groups as well as their state of the art know-how from the TRUST project was invaluable to the positive outcome of the first attempt of focus group specifically related to risks and safety issues related to food contact materials.

## Introduction

The next step was to pay particular attention of the EU project “TRUST” QLK!-CT-2002-02343 “Food risk communication and consumer’s trust in the supply chain”. The research investigated the antecedences of trust in information sources and risk management along the food chain and the mechanisms that determine the social diffusion of trust. This project was focused on the “evaluation strategies brought about consumer to assess the reliability of the message, the way they process risk information with regards to different food hazards, and the cultural gaps between professional risk manager an laypeople”. The closing conference which took place on October 27 2005 (http://www.trust.unifi.it/html/events.html). highlighted particularly interesting features for the analysis of focus-groups. As the main expert who developed specific protocols for focus groups for the TRUST project was also of mother tongue Italian and located in Italy, a subcontract was developed to have the focus group protocols, conduct of focus group and data analysis by this expert who was unique in the collective experience and language to use for a focus group study in Italy.

## Background

### *Context and strategy*

The Focus Group technique dates back to the 1940s (Merton and Kendall 1946), and has had a revival in sociological research in the last decade or so. The general methodology is by now largely established

and a number of handbooks exist, dealing with the different steps, from research design to data analysis, including also practicalities such as setting, tokens, recording, etc.

Within such general rules, an appropriate design is to be prepared for each single exercise, taking into account its aim, purpose, context, as well as the existing resources and constraints.

In order to adapt the Focus Group methodology to the specifics of the FOODMISGROSURE project we proceeded as follows:

- We assessed the objectives and work of the project FOODMIGROSURE Project, focusing in particular on WP7 (Investigation of consumer attitudes towards modelling) in order to best frame our exercise within the existing resources and constraints.
- We investigated the methodological literature devoted to the Focus Group technique (see list of references).
- We surveyed a number of research projects in which the Focus Group technique was used (see attached list) and examined more closely those most relevant for our purposes, according to a number of criteria (e.g. topic, use of ICT, inclusion of modelling, country of work, etc.).
- We went very carefully through the minutes of the Invited Expert Task Force meeting held in Ispra on June 23, 2005 and the dossier sent to the invited experts.
- We discussed informally with colleagues involved in similar work.

- We acquired and examined the dissemination materials produced within the FOODMIGROSURE Project so far.

### *Justification for designing a pilot study*

Within our mandate, we could only build a pilot exercise, for two main reasons:

With just one focus group, attempt generalisations are limited. Due to the limit on the “samples” used in such technique, this is the case even with a larger number of groups. However, in the latter case, “saturation” (Glaser and Strauss 1967) can be reached with some degree of certainty. This occurs when no new ideas, comments or insights are generated in Focus Group discussions, which had not already emerged in previous sessions.

The Focus Group participants (as well as people in general) are certainly not familiar with different risk assessment techniques for food packaging, not to talk about the task of comparing them. Moreover, food packaging is likely to be a minor concern for consumers as a source of risk, as they tend to concentrate more on food scares. In practical terms, this requires that the central issue of mathematically modelled versus measured migration is addressed gradually, by subsequent steps, each requiring an accurate provision of information and an adequate time allocation.

The option of a pilot exercise is however very valuable and also profitable under such circumstances, as it provides preliminary results, as well as useful indications on whether and how such difficult subject can be approached in a Focus Group discussion.

## Experimental approach

As they belong to the family of “qualitative methods of investigation”, focus groups are not meant to be representative of a population in any statistical sense. Also they do not have the purpose of originating aggregate data starting form individual opinions, attitudes, behaviours, etc. Rather they provide a setting for observing communicative interactions among individuals on a given topic. Group dynamics may develop as either cooperative or conflictive. Either consensual opinions may prevail or different, even irreconcilable, views may emerge.

One or more facilitators lead the discussion on the basis of a protocol previously prepared and applying professional rules and skills. They are usually supported by one or more observers and, if appropriate, can avail themselves of ICT (information and communication technology), such as videos, computer models, etc. They must make sure that all the topics are covered and that all participants have an equal opportunity to express their opinions in their own style and according to their preferences and interests. They must keep the discussion on truck, establishing boundaries, but without constraining or hampering participants. The latter’s integrity is the facilitators’ primary concern. Its preservation must outdo any other obligation, including the performance of the task and the satisfaction of the client.

The standard number of Focus Group participants is between six and twelve. Recruitment criteria and methods vary according to goals and circumstances. Normally participants are balanced by gender, age and education, but different designs are possible, according to research design and objectives. Participants must not be acquainted with one another, unless under special circumstances (e.g. patient groups). Also, “professionals” should be avoided, i.e. individuals participating to focus group on a regular basis for remuneration (usually for market research).

Typically a focus group lasts from two to two and half hours. Either tape or video recording are normally used. Full transcription of recorded discussions is not mandatory. Tapes are the basis for analysis which is usually performed by at least two researchers, separately first and then jointly. Recordings are supplemented by facilitators’ and observers’ notes, which include comments on group’s dynamics. The analysis aims to point out how the stimuli provided are either developed or abandoned and complementary issues not included in the protocol are raised. Moreover, opinions, arguments and ways of reasoning and interacting are considered.

The proposed methodology for the implementation of the work presented below is based on the considerations above.

### *Proposed design*

The general rules recommended in the literature (Lunt and Livingstone 1996; Morgan 1997; Morgan and Krueger 1997; Barbour and Kitzinger, J. 1999; Marshall and Rossman 1999; Edmunds 2000; Krueger and Casey 2000; Denzin and Lincoln 2003 among others) and implemented in previous projects (Annex 1) were followed. Namely:

- Six to ten participants were recruited.
- A “neutral” venue was chosen, in this case within the city of Udine, selected for the exercise.
- A protocol was prepared, together with convenient materials to be used by the facilitators (e.g. different types of packages).
- Two facilitators worked together in the group. They defined reciprocal roles and tasks before the discussion.
- two external observers were involved.
- The discussion lasted two, two and a half hours.
- The discussion was audio-taped (subject to participants’ consent).
- A debriefing was held immediately after the Focus Group.
- Audio tapes were listened to as many times as necessary and notes were revised separately by the two facilitators and the observers.
- Subsequently the three worked together and compared and integrated their notes, observations, and insights.

- In case of doubt or conflicting interpretations, tapes were listened to together and notes were revised jointly.
- A report was prepared containing the main findings and the relevant methodological observations.
- Full transcription of the recorded session was not foreseen, but significant excerpts were included in the report.

### *Strategy and objectives of the protocol*

The protocol was constructed in such a way as to gradually lead the participants to consider the different types of risk assessments for food package.

The protocol contained stimuli, questions, and procedural instructions including time allocation to the different issues addressed. However, it needed to be flexible in this last respect. Indeed, in leading the discussion, the facilitators would have to take into account the participants' ability to become familiar with concepts and topics alien to a non-expert audience, such as mathematical migration modelling. Some participants may find it difficult to grasp the differences between types of risk assessments and request further explanations, in order to continue discussion. As the total time budget could not be significantly increased, it was allowed if necessary to re-allocate time within the different sections of the protocol "on the spot".

Besides being ready to revise and rearrange their schedule, the facilitators (and the researchers originating the work) were also prepared to accept different outcomes of the exercise as relevant and legitimate research results, including possible reactions of puzzlement, perplexity or frustration, from the part of the participants.

The purpose of the pilot exercise was indeed also to test whether the methodology was fit for purpose. We foresaw that the structure of the Focus Group, favouring open discussion in an informal atmosphere, would favour the request of clarifications and the expression of genuine opinions, preferences, concerns, and doubts. However, we were aware that the limited duration of the exercise was a serious constraint. Its extension beyond two/two and a half hour was not recommendable, as it would modify the commitment originally requested to the participants and agreed upon. Moreover, problems of fatigue and decreasing involvement would emerge, as it is well known to experienced facilitators and documented in the literature (e.g. Morgan and Krueger 1997; Barbour and Kitzinger, J. 1999).

In summary, the combination of time constraints and difficulty of the topic might condition the possibility of reaching the point for participants to develop well defined and solidly grounded attitudes and to express reasoned opinions towards modelled versus measured migration. If this were the case, suggestions were derived from the pilot exercise on how best to address the issue. These may relate, e.g., to the recruitment procedures, the structuring of the Focus Group, the protocol, the supporting materials or the overall adequacy of the technique for addressing the issue under study.

## *Resulting protocol: General instructions*

A) Since the focus groups belong to the family of qualitative survey techniques they do not aim to obtain representativeness statistics of result. Moreover they do not mean to identify individual opinions, attitudes or behaviors but to supply to a context for the observation of interactions amongst individuals and the development of a process of communication in that dynamics can be of cooperation or of conflict. They can therefore quite emerge either from opinions shared or opinions and visions contrasting or unmixable. The typical participant number to a focus group is comprised between is and ten persons.

B) The advisable duration of a focus group is of two hour- two hours and average.

C) The protocol constitutes a trace for the facilitators. The indicated progressive numbers refer to arguments to face. The phrases indicated in bold do not go necessarily proposed in the shape in that they appear, but identify topics to develop. It is to the facilitators to choose the adapted formulation to the context.

D) The witnesses in italics contain turned indications to the facilitators under suggestion shape, memo and notes. The memo for the facilitators emphasizes aspects interest for the search with respect to that particular argument. They can have the function of input when the interest topics do not emerge spontaneous in the course of the argument. The point lists are not necessarily exhaustive neither alls the points must necessarily be explicit. In no case the points go interpreted like questions to place like such ones.

## Focus group protocol: guide (translated)

**PART 1 INTRODUCTION (15 MINUTES)**

**Introduction of the facilitators**
Distribute the consent letters; introduce the topic of the research (European, financed from EC). Explain the role of facilitators and observers. Explain the reason for presence of recording device (tapes only used by investigators and identity of the participants not revealed). Explain that the participants are free to express their opinion, each one counts, has value. Insist there are no" right" answers, that all are invited to participate actively and remain courteous to others.

**"Please introduce yourself and tell us how the family unit is composed. Beyond price, what do you care about when shopping for food.?**
*MEMO: break off the ice amongst participants and go around table.*

**PART 2 PACKAGING AND ITS FUNCTIONS (30 MINUTES)**

**When you choose foods to buy, what is more important to you?**
MEMO: *Nutritional value, taste, variety?*
*Risk, safety, health?*
*Social relations, lifestyle, culture?*
*Trust?*
*Communication and information?*
*Consumption, convenience?*
*Processing, shelf-life, conservation, packing?*
*Distribution, volume, sale by piece?*
*Regulation and control?*
*Agricultural practices, atmosphere, conservation nature, etc (e.g..: GMO presence)?*
*Ethics and fairness?*
*….*

*NOTE: if the topic of safety does not emerge spontaneously, raise it*

**When you think about safety of foods, which are the risks that worry you?**
*MEMO: Specific cases (BSE, avian flu.)*
*frauds, sophistications?*
*Hygiene (bacterial contaminations, salmonella)*
*Origin?*
*Substances and treatments dangerous for health (fat, hormones, antibiotics, pesticides, irradiation)*
*GMO?*
*Contaminations from food containers?*

*NOTE: If the topic of packaging does not emerge spontaneously, raise it*

**Thinking of different food categories, which types of packaging and materials come into your mind?**
*MEMO: Bottles, jars, cans, boxes, bags?*
*Paper, cardboard, glass, plastic, metal?*

*NOTE: See to what level of details they go into for the description*

**In your opinion which are the functions of packaging and their eventual drawbacks?**
*MEMO: Protection from mechanical damages?*
*Labelling information, composition, nutrition?*
*Protection from air and biological contamination: bugs, bacteria?*
*Protection from chemical agents?*
*Attractiveness: aesthetics, volume of the packaging?*
*Waste management issues & recycling, environment?*
*Storing and transport?*
*Quality or alterations, e.g. taste and aroma of the food?*

**When buying food, do you pay attention to the material with which it is packed?**
*NOTE: explore what importance is given to each packaging material and for which reason.*

**What characteristics of the packaging would affect your choices? Are there food packaging materials that you particulary dislike?**
*NOTE: explore se the eventual preferences connected to specific food packaging and why. Explore also the aspects of packaging to which they give to greater importance: color, shape, convenience, efficiency in the protection or preservation of the food?*

**Which are for you pros and cons of plastics packaging for food?**
*NOTE: if problematic; go back to the topic into section 5*

**PART 3 PACKAGING MATERIALS and RISKS (30 MINUTES)**

**Let's concentrate now on the packaging that enters in direct contact with food. In your opinion, is it possible that they could represent a source of risk; do you have examples coming into mind?**
*NOTE: explore if and to what extent they are confident or not in packaging. If they have examples, explore their interpretation.*

**In your opinion, why or in which such circumstances risk can occur?**
*MEMO Inadequate material with respect to the food (paradox example: paper to contain water)?*
*Exposure of the packaging to improper preservation conditions (too much heat or cold, exposure to sunrays, preservation in proximity of other products that cause an interaciont, excessive pressure (e.g from overlapping objects)?*
*Inadequate use of the packaging during the preparation of foods (e.g. lack of instructions, negligence, e.g. microwavale food tray or plastic film non-microwavable)*
*Leaving food in their packaging for too long?*
*Inadequate consideration of potential interations between packaging and food*

*NOTE 1: Explore if they think that the problems can emerge mostly at home or in different phases of processing or distribution.*

*NOTE 2: Explore to which type of factor they give more importance*

**In your opinion, what could be the cause of these eventual safety issues.**
*MEMO Reduction of protection from external factors (biological / chemical / air / agents of different kind)? Migration from the packaging to the food, or food into packaging?...*

**AS regards to food packaging rules and controls both at the national and EU level. Based on your experience, do you think that the health and safety of the consumer are sufficiently protected?**

*NOTE 1: Explore the confidence level and knowledge in competence and honesty of the regulatory bodies and official controls. Notice if it a role is also attributed to consumer associations.*

*NOTE 2: Explore if the participants know the existence of EFSA, of research centers of the European Commission and therefore of the existence of a European legislation in this matter, of national laboratories (e.g. Institute for Health), otherwise mention at the end to guide.*

**DO you have any idea on how legislation and standards are developed?**

*NOTE: Explore if the idea of laboratory tests and worst case scenarios. Otherwise mention them.*

*MEMO: The acceptance of use of a substance is based on defined sets of toxicological as well as chemical tests. Chemical test are migrations tests which consist in placing the packaging material in contact with liquids simulating food (since it would be impossible to test every type of food). The expoaure of packaging to liquids is then conducted at worst case conditions (temperature, time etc).*

**PART 4 TECHNICAL EXPLANATION OF OF LABORATORY TESTS (15 MINUTES)**

*NOTE 1: Accurately record the type of questions and eventual perplexities. Possible various assignments to various observations (including attention to technical questions and of competence/acquaintance, attention to honesty aspects, seriousness etc.).*

*NOTE 2: See the part of the filmato dedicated to the explanation of the laboratory test (approximately 4 minutes). Show laboratory material examples used (cells, examples of packaging etc.)*

**PART 5. SIMULATION OF MIGRATION (30 MINUTES)**

**Inttroduce the concept of simulation.**
*MEMO: Eplain the concept of simulation and supply examples or parallel in other fields: (flight simulators, automotive incident simulations).*

**The European legislation has recently authorised the use of computer simulations that employ validated models to foretell the potential migration of substances from plastic packaging to foods or food simulants. Scientists will now illustrate how the programme works.**

**SHORT DEMONSTRATION OF HOW THE SOFTWARE WORKS**
*N.B. who explains must only describe the procedure and avoid supplying comparisons regarding testing approaches.*

*NOTE: Accurately record the type of questions and eventual perplexities. Possible various assignments to various observations (including attention to technical questions and of competence/acquaintance, attention to honesty aspects, seriousness etc.).*

**In your opinion, which can be the advantages or the disadvantages of computer simulations to predict migration from plastic materials compare to traditional chemical tests?**
*NOTE 1: Recall that simulation aspects are considered in many laboratory tesst and also in other fields.*

*NOTE 2: Important to remember that both in the traditional laboratory test as well as in computer simulation supplies a overestimation (provided by exaggerated conditions called "worst case scenario").*

*MEMO (not suggestions but hypotheses on topics that the participants could raise):*
*Advantages:*
*Supply supporting tool to the scientist? Supply a quick prediction on potential problem areas or worst cases? Time saving? Reduction of exposure of technicians to chemical agents? Reduction of the chemical waste in the environment? Cost saving?*
*Disadvantages:*
*Predictrive ability of a simulation depends on the knowledge of constituents of the packaging matrials, the food in contact and their behaviour when they interact. Are these models usable only when validated from a large set of experimental data (which attest their validity)? It is not possible to apply new simulations for materials and substances, for which the model has still not been validated*

**To which conditions you think that the simulations on plastic materials are acceptable?**
*MEMO : (not suggestions but hypotheses on topics that the participants could raise): Not a replacement of the laboratory tests (still always need tests to verify validity). Use of the simulation for materials for which the behavioris know.(carrying out traditional tests in cases of new substances, matrrials, or new foods) ? Strict controls on simulation procedures from public authorities (avoid uncontrolled use in compliance situations).*

**PART 6. FEEDBACK and CLOSING (15 MINUTES)**

Summary and verification that all raised points have been considered. Recognise the value of contributions from participants, and thank them again to have participated. Offer availability to answer to any further questions one asks, to provide further information on further research and final outputs.

### *Recruitment*

As regards to the recruitment of participants, the following rules and criteria were adopted.

- Recruitment was done through a very brief questionnaire (4-5 questions) to check willingness to participate and select personal characteristics fitting our design.
- At least ten people were recruited, to be on the safe side in case someone did not show up at the discussion.
- An equal number of men and women were recruited.
- All the participants were informed about the scope of the exercise in writing and invited to sign a letter of understanding, also accepting that the session were audio recorded.
- A token was granted to participants, consisting of gasoline coupon.
- At least eight years of high school education were required, due to the difficulty of the topic.
- Different family compositions were included (single, family with children, family without children, …), possibly reflecting different shopping and eating styles.

Recruitment was organised through short face to face interviews submitted by trained interviewers and based on a questionnaire (see Annex 1). The interviews were performed at a supermarket in Udine, ten

days before the planned date for the focus group. The purpose was to build a group with different characteristics according to gender, age and family composition. Due to the difficulty of the topic, a high level of education was deemed desirable.

Obtaining attention was very difficult, despite identification badges, letters of presentation provided by the JRC, and the promise of a token of fifty euros. A rough estimate is of one person accepting to be interviewed for every four or five being asked. At the end, ten people with the desired characteristics agreed to participate and left their telephone numbers for further contact.

However, only three of them confirmed their availability, when they were phoned for confirmation, some days later. Moreover, despite confirmation, two of them didn't show up at the agreed appointment. As we aimed at a group of eight to ten people and were aware, from previous experience, of the likelihood of last minute cancellations, we recruited six more people. This further recruitment was performed through informal networks using the "snowball" effect and making sure that participants would not know each other. In the end the group was composed of eight persons.

1. Female. 32. University degree. Living with husband and a one year old child. Employee in a private firm.
2. Male. 32. University degree. Single. Managing supervisor.
3. Male. 52. University degree. Married, no children. High school teacher.
4. Female. 50. University degree. Single, no children. High school teacher.
5. Female. 29. High school degree. Single with a child of three. Employee in a private firm.
6. Male. 57. High school degree. Married. Two grown up children. Public employee.
7. Female. 47. University degree. Married with an eleven year old child. Self-employed.
8. Male. 75. University degree. Married. One adult son. Retired, formerly in building constructions.

### *Discussion setting*

The discussion took place in a hotel with conference facilities in Udine on Tuesday 20 June, 2006.

There were two facilitators leading the discussion and one observer, in charge of reporting key words and summarising themes of discussion on a flip chart visible to the participants. Occasionally he consulted the facilitators and the participants themselves to check his notes.

There were also two researchers from the JRC. They acted as observers in the first part of the discussion and subsequently intervened in their role of experts to explain the technicalities of laboratory tests and computer modelling. They brought along laboratory materials and an extract of a video prepared for the 'Ispra-JRC Open Day' of 13 May 2006.

Before start, the facilitators distributed a slightly modified version of the questionnaire used for recruitment (Annex 2) and a letter of assent (Annex 3). They then explained their own role as well as the structure and the general topic for discussion as food safety. The other team members also introduced themselves. Tape recording of the discussion was accepted by the participants under the clause of anonymity in reports and dissemination.

The discussion started at 6.45 p.m. with a tour de table, where each participant introduced him/herself briefly, including family composition and food shopping habits.

## Results of the focus group

### *Executive summary*

The focus group took place in Udine in the evening of Tuesday 20 June, 2006. Participants were recruited through interviews and informal networks, according to the methodology described above. The group was composed of four women and four men. The age range was from 29 to 75. The level of education was purposely high, including only participants with high school or college education. Different family compositions were represented.

The team consisted of two facilitators, one observer and two researchers from the JRC, all with previously assigned roles. The discussion was carried out according to the protocol prepared (see above). Laboratory tools and materials were shown as well as a video and a computer simulation.

The discussion lasted two hours and a quarter, and participants got immediately involved, showing a notable level of interest. Their interventions were usually appropriate and their comments often

sophisticated, capturing the numerous aspects of the food packaging issue, from research to regulation and controls. Some participants touched upon complex issues such as the scope and limitations of scientific research and the researchers' ethics, making a case for the importance of humility and recognition of uncertainty.

The points which are most relevant for the overall the project FOODMIGROSURE project are summarised below.

As regards food selection, quality emerges as a shared key criterion, though somewhat conditioned by time and budget constraints. The idea of quality includes a number of meanings: freshness, taste, naturalness, pleasure, healthiness and safety. Low price is taken as a cue to low quality (and possibly reduced safety).

The issue of quality controls is of the uttermost importance for participants and keeps coming up in different associations during the discussion. There is widespread awareness of and basic confidence in regulation and controls, both at the national and European level.

The great availability of information is appreciated, despite the difficulty in detecting useful and honest messages and advice from manipulative ones.

The issue of packaging is raised spontaneously as a matter of concern. Normally, packaging is mentally associated with long shelf life and

elaborate processing, while it is rarely spontaneously considered in relation to fresh food.

The responses to the verbal stimulus “packaging” reveal three types of understanding: packaging materials per se; foods in conjunction with their packaging; specific typologies of packaged food (frozen, pre-cooked and plastic vacuum-packed food).

Regarding possible problems related to packaging, the following two are identified: migration and food decay. Whereas the latter is attributed to inappropriate packaging, the former is ascribed to non compliance with norms or inappropriate use.

Participants speculate that industry is less preoccupied of consumers’ safety than its own profit. Accordingly, they are afraid of low compliance with packaging regulations and even fraud.

Overall, participants recognise the benefits of packaging in terms of hygiene and safety, also due to constant improvements in packaging technologies. There is no principled objection to any specific type of packaging, including plastics. “Appropriateness” emerges as an umbrella criterion, including safety as well as visual attractiveness, easy handling, transporting and storing, etc.

Some food-packaging combinations are particularly disliked, for a number of different reasons, ranging from safety to visual appearance, from taste to limited choice. Some participants sometimes recognise

theirs as idiosyncratic and not rationally grounded. Again, judgement criteria are referred to an encompassing idea of 'appropriateness'.

Participants are satisfied with the demonstrations and explanations of laboratory testing offered by the JRC researchers. Their satisfaction is grounded in a positive image of chemistry as a highly respected discipline, relying on solid procedures and producing reliable data. Also they appreciate the work documented and the experts' willingness to dialogue with them.

The main and most frequently expressed preoccupation is that laboratory results are not taken in due account by industry and retailers. Questions are raised and doubts are expressed repeatedly about the connection between problems detected in the laboratory and practical actions implemented to prevent risk for the consumers.

Participants seem to grasp the general idea of computer simulation and are satisfied with the illustrations provided.

There are no principled objections to the use of simulation in the investigation of food packaging safety. Computer modelling is deemed efficient and useful, provided that input data are of good quality. Some cautionary remarks are raised about simulation being a proxy of the real world and not its exact reproduction. Simulation is appreciated also in so far as its use reduces the need for animal testing. Neither diminished use of chemicals nor any other benefits are mentioned

Although the rationale of the “worst cases” in risk assessment doesn’t seem hard to understand or accept, the idea that non conformity to legally established standards is not equivalent to lack of safety is difficult to grasp and agree to.

In general, expressions of concerns for health and safety are accompanied by others pointing to the benefits of current packaging technologies. This results in a balanced assessment, combining common sense and notions acquired either during the discussion or previously.

There discussion shows that there is a largely shared consensus in attributing the main value of research to its applications for the public benefit. The use of computer simulation is neither objected to nor deemed inferior to laboratory testing. In both cases the basic concern is about the ability of techniques and procedures to generate a positive and robust spin-off in terms of consumers’ protection.

## *Focus group discussion*

### *The first stimulus proposed was about criteria for food selection. The participants were asked what they pay attention to, when buying food.*

Quality of food emerged as a shared key criterion. Quality encompasses a number of meanings: Freshness above all; then taste, naturalness,

pleasure, healthiness and safety. Some participants are satisfied with sticking to particular brands they know; others make an issue of buying different products in different stores, in order to satisfy personal criteria of health safety, freshness, etc.

> *I never buy meat at the supermarket. I always go to my favourite butcher. Also, I prefer a certain bakery… I end up cycling through town to buy different products at different places (P7, female).*

Another participant, with a three year old daughter showed a similar attitude:

> *I try to buy fresh dairy products daily (P5, female).*

Others, though concerned, are conditioned by time and budget constraints. On a daily basis they find it more practical and cheaper to shop at supermarkets. In any case, they all do pay attention to products' expiry dates.

> *Usually I am driven by what I feel like eating that day. Before buying I look at the brand and the expiry date (P2, male).*

Most participants stress that there is plenty of information, which can be extracted from labels or is provided by the retailer (Coop is specifically mentioned for its active information policy). Even advertising is mentioned as a source of information, even if potentially biased. Although they appreciate the large availability of information, the

participants are doubtful about their own ability to discern scientifically grounded information from mere publicity. They denounce the puzzling effect of too many stimuli among which it is difficult to detect useful and honest information from manipulative one.

The issue of packaging was raised spontaneously and almost immediately by a male participant as his main concern in relation to quality and safety. He specifically mentioned Tetra Pak.

> *I always prefer glass to Tetra Pak. I read about possible problems with this type of packaging. I understood that some packaging does not comply with regulations (P8, male).*

The others agreed but mentioned other priorities over packaging: freshness, naturalness, taste, and origin. For example, they insisted on the bad taste of some canned food, in particular asparaguses. They take bad taste as an indicator of poor quality, of either product or packaging.

Another participant raised the issue of packaging as related to waste production and disposal.

***The facilitators then solicited the participants to focus on food safety in relation to packaging, expressing their main worries.***

Some of the themes previously emerged were addressed in more depth and detail. Overall safety was associated with taste, the latter being a

hint of the former. Also freshness was associated to healthiness, as fresh food is assumed to contain less additives and preservatives. From the comments of the participants, it clearly emerged that for most of them the idea of 'packaging' is spontaneously associated to long shelf life and elaborate processing. For example pasta was never quoted whereas honey and oil were. Only in the proceeding of the discussion participants recognised that even fresh food is usually packaged.

> *Just looking at the labels one realizes the presence of additives, preservatives and fats in foods, and of dry residue in mineral water. When one discovers how olive oil is made, one gets scared. The more one knows, the more one is terrified (P6, male).*

> *When one is in a rush, one picks up things without thinking too much (P1, female).*

Low price is often taken as a cue to low quality (and safety), in particular as regards olive oil. However, price is recognised to be a serious constraint, and consequently some 'compromise'' is deemed necessary.

Most participants said they pay attention to where the food comes from, and distinguished in particular between European and non-European origin. The former was perceived as an element of reassurance due to plenty of regulations and controls, for example about pesticides.

> *I have seen canned asparaguses coming from China, where controls are not the same as European ones. For me, origin is more important than packaging (P4, female).*

*When I read 'packaged in Italy', I have no guarantee about the food origin, which could be anywhere (P5, female).*

Although label information is appreciated, the suspicion remains that it may not always be exhaustive or trustworthy, to the point of occasionally masking fraud.

The issue of bad taste of canned food came up again and one participant expressed concern for migration of metal parts from container to content, adding:

*If it were glass I would not worry (P3, male).*

It is worth noticing that the no one of the recent, highly publicised food scares of the last decade were mentioned (BSE, avian flu, growth hormones, GMOs etc.). Also, there was no talk about were food irradiation or use of antibiotics in animal breeding.

***The next theme addressed concerned the type of packaging. The participants were invited to mention what first came to their minds.***

There were three types of replies. Some concerned the packaging materials themselves, namely plastics, polystyrene, Tetra Pak, glass, and cans. Others consisted of specific examples of foods or beverages and their packaging, like pre-washed salad or mozzarella in plastic envelopes,

*…always difficult to tear apart ( P1, F)*

or:

*Tavernello wine in cardboard' (P3, M) (actually it is Tetra Pak).*

Other replies refer to categories of products, such as frozen, pre-cooked, and plastic vacuum-packed foods.

The generic term 'plastic' was normally used, with the only exception of Tetra Pak being identified by its specific name.

Interestingly enough, paper was never mentioned and neither was cardboard, except for the inappropriate attribution above (Tavernello wine).

The issue of waste disposal and recycling in relation to environmental pollution was raised again in this context.

***The next stimulus by the facilitators was about functions and possible drawbacks of packaging.***

The functions first identified were food protection and conservation. Others were mentioned in relation to transport, shelving, and handling, such as protection from rupture, easy piling up, etc.

Different problems were thought to derive from the interaction between a certain food and its packaging. First is the possible migration of elements of packaging to food mainly attributed to non compliance with norms. Second is food decay due to inappropriate packaging (e.g. olive oil is to be kept in dark glass bottles). A third set of problems is recognised at the interface 'consumer-packaging', rather than 'food-packaging'. This is the case, for example, with labels sticking to hands or boxes staining dresses and shopping bags.

Another complaint is about the poor ergonomic design of some type of packaging, which results in inconveniences for the consumers (e.g. difficult for holding, storing, etc.).

> *There are poorly designed mineral water bottles. They cannot be handled comfortably (P8, M).*

One participant lamented that standardised packaging forces her to purchase of predefined amount of product. Others objected that it makes consumers' life easier.

Packaging disposal emerged again, this time as a widely shared concern. However, it was acknowledged that many types of packaging are now recyclable. One participant remarked that

> *It is important that packages can be recycled for different use. For example, biscuit metal boxes can be reused for storing small objects (P3, M).*

The aesthetics of the packaging is considered to have both positive and negative impacts. On the one hand it elicits interest and provides information. On the other, it may divert attention from the nutritional value.

***The facilitators asked the participants whether they had any particular idiosyncrasies for packaging types or materials.***

Replies can be grouped in three categories similar to those applied to concerns about packaging materials. A first set of replies referred to a particular type of packaging, namely tin cans.

> *I do not like tin cans, but in any event I prefer those with the white coating as they look less like tin cans (P4, F).*

A second set concentrated on packages in connection with a specific kind of foods:

> *Wine in cardboard boxes (P3M)*

> *Seafood in plastic (P1F, P7F)*

The very appearance is judged unattractive and triggers a reaction of dislike, or even repulsion.

Finally, a third set of replies put together all plastic vacuum-packed food. As in the previous case, dislike is based on visual un-attractiveness, and not on safety or health concerns.

***The next part of the discussion focused on plastics. The facilitators asked for its advantages and drawbacks for packaging.***

Most comments focused on perceived inconveniencies or risks. There was a widespread concern about the possible migration of toxic components into food, also due to inappropriate usage, e.g. exposure to heat. Concern was accompanied by uncertainty about the actual existence of such risk, and the actual possibility of assessing them. Information was judged as either absent or alarmist, generating an occasional raise in concern about specific products or processes, but failing to provide up to date and valuable instructions and advice. Many participants said they resent the limited possibility of choice, making specific reference to bottled water. By now, they said, water is available in bottles of different size and shape, but all made of plastics. Lack of alternatives induces adaptation and habit tends to remove concerns about risk.

> *We have been forced to use plastics because bottled water in glass is very difficult to find. I buy glass bottles whenever I find them available, but now I am less committed to seek them out than years ago (P7, F).*

*Because of real difficulties in doing without them, I have somewhat accepted plastic bottle (P8, M).*

*The information one receives often creates alarm rather than reassurance (P6, M).*

*Tetra Pak is sensitive to heat and I fear it may be dangerous (P3, F).*

Concerns relating to taint were expressed:

*I keep being concerned about possible migration of components to water (P8, M).*

*Moreover it smells (P5, F).*

Some environmental concerns also emerged:

*Plastic cannot be destroyed (P5, F).*

The only positive trait of plastic bottles identified by the participants is that they doe not break.

*Unlike glass ones, plastic bottles do not break, so they are safer in particular for children (P5, F).*

***The following of the discussion addressed possible risks from direct contact between plastic and food.***

The participants demonstrated awareness of and confidence in, regulations and controls. The possibility of misconduct or even fraud was mentioned, but as an exception. The main concerns regarded 'real world' practices, including unforeseen contingencies and the sheer difficulty of a total control.

*Problems do not originate so much from the packaging, but from daily practices of use (P2, M).*

*The risk resides in the many steps from packaging to consumption, more than in packaging itself (P1, F).*

*Water is transported on trucks for long journeys without any protection from the sun, before it reaches the shop shelves (P6, M).*

*Oil can be appropriately bottled, but it deteriorates if exposed to heat (P5, F).*

*If not appropriately handled, frozen food deteriorates despite proper packaging (P7, F).*

*When implemented, controls are very accurate. However it is impossible to control all products at all times (P6, M).*

*There is a lot of information about norms and controls. One hopes that they are implemented, but one can never be sure (P1, F).*

*Some retailers adopt the policy of providing abundant and detailed information on quality and safety of products, processes, and packaging. This makes me feel protected also because I belief that such policy enhances people's awareness and consequent attention to safety and health issues (P7, F).*

Some participants are convinced that a certain amount of risk, though very low, is intrinsic, inherent to the very interaction between plastic and food. Even the best strategies of investigation cannot reproduce all real world conditions.

*It is inevitable that some carcinogenic particles migrate from plastic to food (P3, M).*

*Tests reproduce some conditions, according to established standards, but they cannot take all circumstances into account (P4, F).*

It is worth noticing that there was no mentioning of possible risks from external contaminants, such as chemical or biological agents. Participants concentrated on migration, either spontaneous or due to improper usage and exposure to atmospheric agents. Some insisted on the connection between price and safety. When price is too low, one can suspect less care for safety, considering that profit is a key priority for industry.

*It is a problem of costs. It would be better to use glass for bottling water, but plastic is cheaper (P3, M).*

Other functional aspects of packaging emerged, such as the choice of a particular shape or material to improve resistance to shocks and facilitate transport and storing.

After discussing risks at length, participants spontaneously turned to the advantages of present types of packaging, including plastics.

> *Today we tend to be over-critical and over-concerned to the point of psychosis (P1, F).*

> *From a hygienic viewpoint we have gone a long way in a positive direction. Modern packaging and food processing (e.g. milk sterilization) ensure safety and protect health. There are also improvements concerning information, thanks to labelling and many other sources and initiatives. Sometimes I worry, but I feel that common sense is to be applied in considering all aspects of the present situation with respect to the past (P7, F).*

***The next point addressed regulations and controls at the national and European levels.***

The facilitators enquired first about the participants' knowledge about the existence of regulatory and control authorities. All were convinced or aware of the existence of both national and European organisms. Some quoted specific Italian bodies, such as ASLs (Aziende sanitarie locali) and NAS (Nuclei anti-sofisticazione). Questioned about EFSA (European Food Safety Authority), no participant knew of its specific functions and location, although some had heard of its existence.

In the following, the facilitators' questions were directed to assess the participants' knowledge about procedures for deciding food norms and standards. The only specific reference was to laboratory tests, on both food and packages, including migration. One participant, apparently more informed than the other on this specific issue, cited a consumer association magazine as his source of information.

### *JRC experts' intervention*

First of all an extract of the video prepared for the 'JRC Open Day' was shown. Four minutes were selected, which were dealing solely with tools and processes of laboratory testing. Among others, the video illustrated the idea that it is not possible to test all and any combination between foods and packaging. Therefore computer simulations are used.

To complement this information, the experts showed some migration cells and other tools they had brought with them, and described the different phases of testing. They underlined that tests do not use real food but 'simulants', such as olive oil for fats, acetic acid 3% for acid foods, etc. Then time and temperature exposure are selected for creating worst case conditions. Criteria for testing are established by specific norms. The more refined the tests the more precise the risk estimate.

One participant asked how thresholds of human tolerability are established, since toxicological parameters are based on animal tests.

The experts explained the existence of the conventional safety factor and expanded on the idea of worst case, explaining that tests are designed in such a way as to reproduce a situation far beyond any real world contingency (e.g. a person eating the same food every day for a life time with a substance migrating from its package in high quantity).

Most participants were inquisitive about the connection between possible negative results of testing and practical action in order to prevent any risk for consumers.

If you find a problem, at which level do you intervene? Do you report to public authorities? (P7, F).

The experts explained the difference between authorization/compliance and risk/exposure. The authorization of a certain substance is based on a detailed dossier submitted by the producer. Among other, the dossier must contain information and test results on all substances that can enter in contact with a product, including those used in the packaging process (e.g. a lubricant of machinery). The authorization sets the admissible quantity of a substance applying very cautionary criteria. Consequently thresholds are set much below the quantities able to generate a risk for health. Whenever there are hints to possible violations, the product is withdrawn from the market. However, non-compliance with the authorization does not necessarily mean that there is a risk for consumers, precisely because of the cautious criteria applied.

The participants were also interested in measures for preventing fraud and the connection between laboratory tests and the actual repression of malpractice.

> *I suppose that some types of packaging are patented. Is there any control so that over time their composition is not modified … so that there is no fraud? If I understand correctly, your job is to analyse the possibility of migration, and you do not have a say on possible frauds (P6, M).*

The experts clarified that substances are tested one at a time. They also remarked that it is in the interest of producers themselves to avoid migration between packaging and food.

A participant objected:

> *But if they want to save money….? (P1, F)*

To which the experts responded that an example of source of savings come from the quantity of material used in packaging. For example plastic bottles nowadays are much thinner than jus a few years ago, also to extend shelf life.

***The next part of the discussion focused on the idea of simulation for risk assessment.***

The experts probed on the participants' understanding of the simulation techniques as presented in the video. They also remarked that computer

simulations used in their case are different from other types of simulations (e.g. car crashes). They added that simulations integrate and do not replace testing when the latter is necessary to gather relevant information. For example simulations are not yet authorised for PET. Simulations replace tests when plenty of experimental data are already available, so that it is possible to insert them into mathematical models. Such models are designed as to reproduce worst cases.

***At this point the experts provided demonstration of the software used for simulations.***

The participants watched with interest, but some of them admitted they had not fully understood the details. Yet they said they had grasped the general idea of computer simulation and were satisfied with the illustration provided.

***The next stimuli were aimed at eliciting the participants' opinions on the benefits and drawbacks of computer simulations.***

The participants' comments related to three main areas of concern. The first one can be defined 'competence and trust'. The subjects acknowledge their own inability to understand both the data and the procedures that produce them. Thus the acceptance of the conclusions drawn from research is a matter of trust.

*My doubt is not about the techniques but about the interpretation of data. To be really convinced one should be competent enough. Data always require to be interpreted and I am not able to understand to what extent interpretations are reliable. Interpretations are always purpose-oriented, there is no such thing as an objective research. Thus it is a matter of trust, of faith in the researchers (P7, F).*

The other participants shared a basic confidence in researchers and scientific processes, whereas the same is not true for industry. The latter is considered mainly profit-driven and therefore inclined to cut corners as concerns consumers' health and safety.

These comments were paralleled by a renewed concern about controls. The participants' worry was about the extent to which the substances used in packaging are actually the ones tested in the laboratory.

*There is a missing link. Industry should guarantee that the packaging is prepared according to tests (P8, M).*

*Control is the real problem (P1, F).*

Upon the invitation of the facilitators the participants addressed the issue of computer simulations more specifically. There was definitely no principled opposition against their use, rather different levels of acceptance were present. This resulted in a lively discussion between the participants. Not necessarily is this the case at the end of a focus group session. Indeed, on the one hand the participants are more acquainted to each other and tend to feel more at ease. On the other hand they are tired or even annoyed. Thus it is reasonable to assume

that the topic roused a lot of interest. Not only did it generate questions addressed to the team members, it also produced an exchange of opinions among participants, who got involved in a heated, though civilised, debate.

It is possible to identify three topics around which the debate was articulated. The first was the reliability of chemistry as a discipline implying established research procedures. Chemistry is perceived as a very solid discipline and therefore a source of reliable data. The second topic was the reliability of the computer as a device for building refined and powerful models, provided they are fed with accurate data. The third one was about simulation procedures themselves, eliciting both positive and critical remarks. The former were focused on sparing animal lives by way of simulations; the latter on the imperfect relationship between simulation and reality, including the crucial role of the analyst in interpreting results.

To better account for the debate, we would reproduce it as it occurred, instead of singling out single quotes.

> *The technique does not make a difference. The simulation approach as it was shown seems very correct, even if I got lost in the technicalities. Either laboratory testing or simulations are good for me if I decide to trust the researchers. On the contrary I am inclined to mistrust industry because it is totally profit-driven. One issue is interpreting simulation data; a different issue is implementing scientific findings in the market (P7, F).*

> *I feel a bit uneasy with simulations, even if they consider worst cases (P1, F)*

*It is a matter of cultural impact, as there is a difference between 'virtual' and 'practical'. One doubts that input data leave something out. It may be a mere sensation as probably input data are correct. The issue is not so much about the final results of simulations. The issue is: if a see a dead mouse, I know it is dead; if it is the computer telling me the mouse is alive, I do not see it alive. However simulation may have many benefits, for example of an economic type (P4, F).*

*I am really confident in chemistry. It is not important if computer simulations simplify reality, as the approach is the same. Your observations go beyond chemistry. For me the computer is better as it reduces errors in tests and guarantees a greater rigour of procedures (P6, M).*

*Are you sure it is so precise? In any case it is a human artefact (P1, F).*

*But a program is being refined for years to be optimised. Chemical methodology is rigorous and the computer does not err provided the input data are correct (P5, F).*

*You may be right. Possibly I feel uneasy because I do not see the dead mouse (P1, F).*

*To the contrary, it is better to have one mouse still alive because a computer key was used instead (P5, F).*

*I believe that simulation is the future, for example in the medical field (P4, F).*

*I have no doubts. I am sure that simulation is appropriate. Nowadays everything is based on simulation. We all work with this type of things. Subsequently data*

*are confronted with those from laboratory tests. Those who know the procedures know that approximation is very good; application of statistics is rigorous (P3, M).*

*I am in favour of simulation techniques, as in any case we must trust the analysts. It is not so much the technique but those who apply it. In any event I think that simulations must accompany rather than replace laboratory tests (P2, M).*

*The key point is that the results of the analysis are taken into account (P8, M).*

The economic advantages of simulations were mentioned in passing by only one participant, and there was no mention of other benefits, such as, for example, time saving and diminished use and disposal of chemicals to the advantage of both researchers' health and the environment.

### *Discussion closure*

The facilitators asked whether it was felt that some important themes were left out, triggering the following responses.

*Yes, an important topic: the limits of science. A kind of blind trust is expected, whereas some question marks always remain… We see and measure only a part of reality and have a limited awareness. I am very confident, however, and I am happy to see the kind of work that you are carrying out. Yet I think that science itself is limited… It is important to work with humility (P4, F).*

*We concentrated on the theme of health, but there are many other aspects. I boycott some products just because they are available only in packages containing very large quantities (P7, F).*

Participants agreed that there was no time to expand on such issues or any other. The facilitators then asked whether a summary of the discussion was felt necessary and all participants responded they were satisfied with the notes written on the flip chart. All but one asked to be sent a summary of the report of the Focus Group discussion, once ready.

The discussion closed at 9.00 p.m. A token of 50 euros in gasoline coupons was awarded to each participant together with some gadgets. Refreshments were offered afterwards.

## Conclusions

These conclusions provide a synthetic appraisal of the discussion, eliciting the points which are most relevant for the 'the project FOODMIGROSURE' project.

The discussion proceeded smoothly. The participants demonstrated high interest and attention, reacting to the stimuli, asking questions, raising

issues, and interacting both with the team members and among themselves in a lively and civilised manner.

Facilitators had no difficulty in keeping the discussion on track, as there were only occasional side talks and diversions.

Interventions were usually appropriate and comments often sophisticated, capturing the numerous aspects of the food packaging issue, from research to regulation and controls.

Possibly the relatively high level of education of the participants contributed to their ability to handle the information provided and grasp the spirit of the exercise.

The key findings can be summarised as follows.

- Quality emerges as a shared key criterion for food choice, though tempered by time and budget constraints. The concept of quality encompasses a number of meanings: freshness, taste, naturalness, pleasure, healthiness and safety.
- Low price is taken as a cue to low quality (and possibly safety).
- The issue of quality controls is of major relevance and keeps coming up in different associations. There is widespread awareness of and basic confidence in regulation and controls, both at national and European levels.
- None of the highly publicised food scares of the last decade are mentioned.

- The existing great availability of information is appreciated, despite the difficulty in detecting useful and honest messages from manipulative ones.
- Participants say they are attentive to labels and expiry dates. They feel that packaging design may either favour or hamper quality choices.
- The issue of packaging is raised spontaneously as a matter of concern.
- The idea of packaging is spontaneously associated to long shelf life and elaborate processing.
- People conceive of packaging in three different ways: packaging materials; foods in conjunction with their packaging; specific typologies of packaged food (frozen, pre-cooked and plastic vacuum-packed food).
- Two main problems are identified regarding the interaction between food and its packaging: migration and food decay. Whereas the latter is attributed to inappropriate packaging, the former is ascribed to non compliance with norms or inappropriate use.
- Participants speculate that industry is less preoccupied of consumers' safety than profit. Accordingly, they fear low compliance with packaging regulations and are concerned about possible frauds.
- There is no spontaneous mentioning of possible risks from external contaminants, such as chemical or biological agents.
- Bad taste is taken as an indicator of poor quality, of either product or packaging.

- Participants recognise the benefits of packaging in terms of hygiene and safety, also due to constant improvements in packaging technologies.
- There is no principled objection to any specific type of packaging, including plastics.
- Some food-packaging combinations are particularly disliked, based on a number of intertwined justifications, ranging from safety to visual appearance, from taste to limited choice. Idiosyncratic criteria of ‘appropriateness’ are applied to food-packaging combinations.
- Participants are satisfied with the demonstrations and explanations of laboratory testing.
- Chemistry is a highly respected discipline, relying on solid procedures and producing reliable data.
- Participants show a basic trust in the work documented by the experts and express their appreciation for the willingness of the experts to dialogue with members of the public like themselves.
- Trust investments are recognised as necessary and even inevitable in the lack of adequate knowledge and skill for understanding the research procedures, their rationale, and underlying assumptions.
- Participants’ main worry is about laboratory results being taken in due account by industry and retailers. Inquiries focus on the connection between problems detected in the laboratory and practical action to prevent risks for consumers.

- Participants seem to grasp the general idea of computer simulations. They are satisfied with the illustrations provided and willingly accept applications to food safety.
- There are no principled objections to the use of simulations. Some cautionary remarks are raised about simulation being a proxy of the real world and not its exact reproduction.
- One positive aspect of computer simulations is the perceived (or hoped for) reduction of animal testing. No other benefits are identified, such as diminished use and of chemicals.
- Computer modelling is deemed efficient and useful, provided that input data are of good quality.
- Though there are no difficulties in understanding and accepting the rationale of ‘worst case’, the distinction between scientifically assessed risk of a certain substance and conformity to legally established thresholds remains difficult to grasp and accept.
- An attitude of humility is deemed appropriate for researchers, as well as awareness of uncertainty.

**Three final reflections can be drawn from the exercise.**

a) Food choice criteria and trust investment in science as a social institution are consistent with the results of previous research, namely the 'PABE' and 'TRUST' projects[1].

b) Expressions of concern for health and safety are accompanied by others pointing to the benefits of current packaging technologies. This results in an overall balanced assessment, combining common sense and notions acquired either during the discussion or previously.

c) Participants perceive research as strictly connected with its application for the public benefit. They do not make a major point of simulations versus laboratory testing, or any other technique. All accredited procedures are accepted, provided that they generate a positive and robust spin-off in the practices addressed to consumers' protection.

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All supporting documents related to this chapter can be found in Annex 3

[1] Both projects were funded by the European Commission. The first was a Shared Cost Action under the Fourth Framework Programme: "Public Perception of Agricultural Biotechnologies in Europe (PABE)", 1998-2000, <http://www.lancs.ac.uk/depts/ieppp/pabe>. The second was a Shared Cost Action under the Fifth Framework Programme: 'Food Risk Communication and Consumers' Trust in the Food Supply Chain (TRUST)" 2003-2005, <http://www.trust.unifi.it>

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# Phase 4:
# Quantitative approach by questionnaires (citizens/associations)

## Introduction

The first step towards a polling attempt was born the publication of a Eurobarometer survey on risk perception was jointly commissioned by EFSA and the European Commission Health and Consumer Protection Directorate General (DG-SANCO). The survey on which the report is based was conducted in the 25 Member States of the European Union in September-October 2005. EFSA, contributed to the food safety section (http://www.efsa.europa.eu/en/about_efsa/communicating_risk/risk_perception.html). Yet even though materials in contact with foods are a theme treated within the EFSA mandate and scientific working groups, it was not considered in the risk perception study released in February 2006.

Therefore we decided to also develop a quantitative questionnaire polling combined with a pioneering event in public participation; to do so, we took advantage of a foreseen “open-day” to the JRC where about 2,500 visitors were expected (May 2006).

Our goal therefore became three fold: because the topic of food packaging safety is not perceived by the public, we had a part of risk education and communication; because it was the open day we had a goal of exhibiting in simple terms the type of research and the means for doing it that the JRC possesses. And because of the highly focalised nature of the project FOODMIGROSURE project we had to test people

on their perception of mathematic modelling as a mean to simulate and predict migration from food contact materials.

## Experimental

As this type of initiative had never been attempted before, we first researched expertise in science communication to the non-scientist, where we first organised a brainstorm with a know expert (Dr. Alun Lewis) on how to organise the part of science communication to the non scientist. The outcome of the brainstorm was to take an approach of polling more suited to the event which included other key goals such as science communication and exemplified JRC work in the field. Because of the number of visitors needed to poll and the increasing complexity of the polling topic (modelling) as well as fast pace of visitors and limited time span per visit and polling, it was decided to develop a video which would retain neutral characteristics but would have an entertaining quality, followed by a rapid tour of the laboratory that would recall the concepts testing to modelling, followed by the compilation of a questionnaire on the information received.

### *Video*

The next steps were directed towards the development and realisation of the video. This theme is not detailed here, only the key elements involved in the process:

- Writing a script according to specific attention grabbing rules taught in film-documentary making.
- Film scenes both in-house in laboratories and outside. Only scientists were involved due to time-constraints and privacy laws hindrance otherwise
- Cutting and editing.
- Test runs and show

### *Questionnaire*

We in parallel developed a questionnaire based on the one used by EFSA and questions raised in the EU TRUST project, and checked both with the focus group experts and with consumer associations.

Indeed, contacts were also established with consumer associations, in order to investigate reaching consumers via their associative role as well as to study approaches on how to do so. An informal collaboration was agreed to with the federations of consumer association of the whole region as follows:

- Checking questionnaire with P05
- Having a platform for briefing of their 35 operators on this area

- ❖ Have the presence and help of the 35 operators during the open day to listen to visitors and help questionnaire collection.

The results would be analysed together and they could use the information for to expand their knowledge base.

A test trial was planned on consumer associations with 35 representatives of the Lombardia region.

### *Polling environment design*

Because the topic of packaging is quite unknown to the citizen, we prepared visual stimuli with an art piece made of packages (figure 1), and posters (figure 2). Visitors were then given a tour programme (figure 3) that explained our goal within the project in addition. The tour was of a total of 20 min and about 5 min to compile the questionnaire (figure 4). To quickly and entertainingly illustrate safety of food packaging, we developed a short movie (figure 5) to educate the public on the general risk issues and tests associated with packaging. The resulting video (12 min) was shown followed by a visit of 3 of the laboratories for visual impact where the same scientists were welcoming visitors and answering questions. The questionnaire was given upon exiting and completed questionnaires were rewarded with a small gadget.

A test trial was run on consumer associations with 35 representatives of the Lombardia region.

The experiment was then conducted on citizens in full scale during the JRC Open Day which was highly publicised regionally (figure 6) in total.

The event also involved the presence of the consumer association representative. Questionnaires and comments were colleted for 700 units which represented about 1400 visitors to the food contact activities.

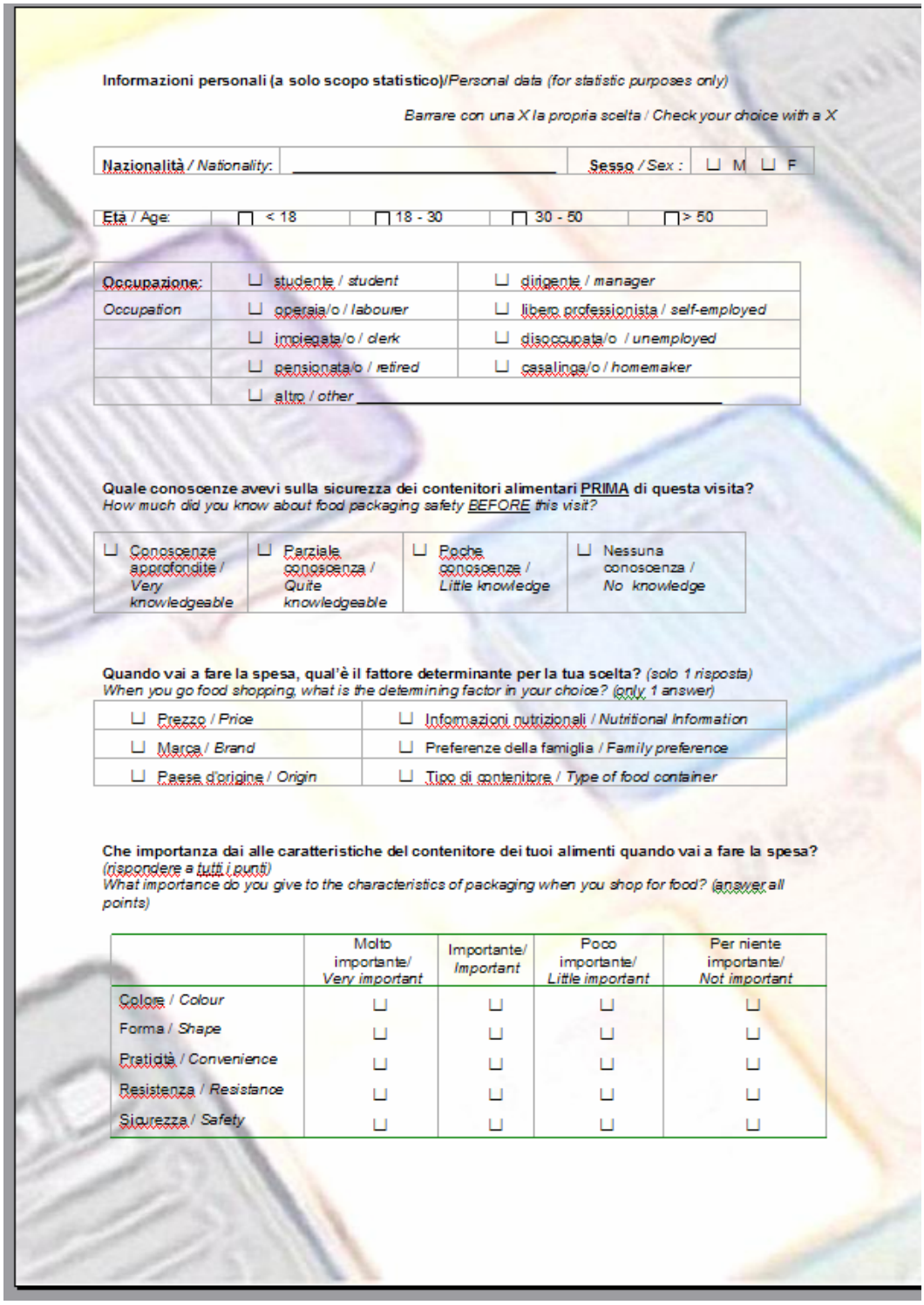

**Figure 1: the advertisement**


**Figure 2: the tour programme**


**Figure 3: "stimuli" provided as posters at the entrance and welcome area.**


**Figure 4: another "stimulus" taking the form of a sculpture**


**Figure 5: the questionnaire**



**Informazioni personali (a solo scopo statistico)**/*Personal data (for statistic purposes only)*

*Barrare con una X la propria scelta / Check your choice with a X*

| Nazionalità / *Nationality*: | _____ | Sesso / *Sex* : | ❑ M | ❑ F |
|---|---|---|---|---|

| Età / *Age*: | ❑ < 18 | ❑ 18 - 30 | ❑ 30 - 50 | ❑ > 50 |
|---|---|---|---|---|

| Occupazione: | ❑ studente / *student* | ❑ dirigente / *manager* |
|---|---|---|
| *Occupation* | ❑ operaia/o / *labourer* | ❑ libero professionista / *self-employed* |
| | ❑ impiegata/o / *clerk* | ❑ disoccupata/o / *unemployed* |
| | ❑ pensionata/o / *retired* | ❑ casalinga/o / *homemaker* |
| | ❑ altro / *other* _____ | |

**Quale conoscenze avevi sulla sicurezza dei contenitori alimentari PRIMA di questa visita?**
*How much did you know about food packaging safety BEFORE this visit?*

| ❑ Conoscenze approfondite / *Very knowledgeable* | ❑ Parziale conoscenza / *Quite knowledgeable* | ❑ Poche conoscenze / *Little knowledge* | ❑ Nessuna conoscenza / *No knowledge* |
|---|---|---|---|

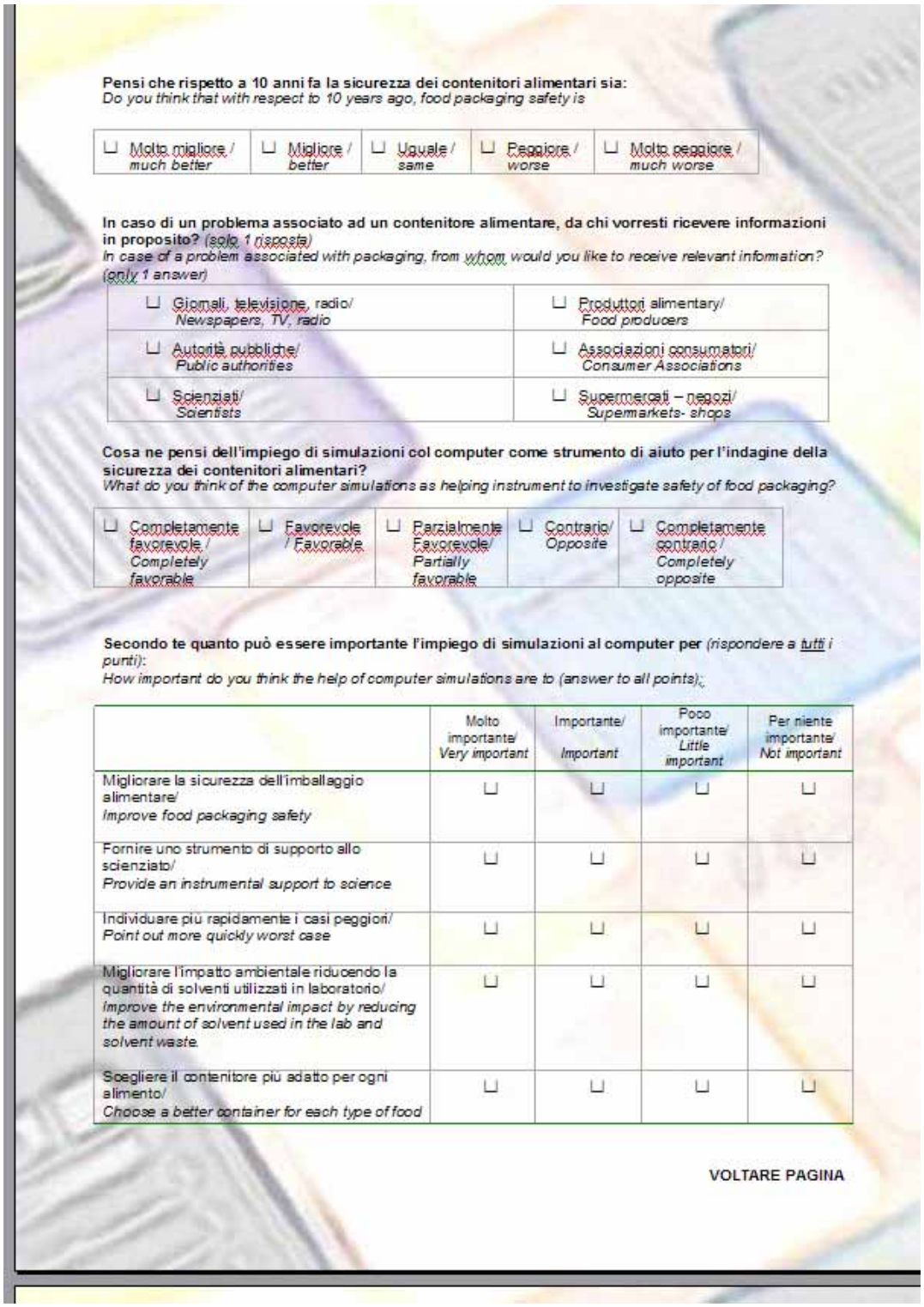
**Quando vai a fare la spesa, qual'è il fattore determinante per la tua scelta?** *(solo 1 risposta)*
*When you go food shopping, what is the determining factor in your choice? (only 1 answer)*

| ❑ Prezzo / *Price* | ❑ Informazioni nutrizionali / *Nutritional Information* |
|---|---|
| ❑ Marca / *Brand* | ❑ Preferenze della famiglia / *Family preference* |
| ❑ Paese d'origine / *Origin* | ❑ Tipo di contenitore / *Type of food container* |

**Che importanza dai alle caratteristiche del contenitore dei tuoi alimenti quando vai a fare la spesa?**
*(rispondere a tutti i punti)*
*What importance do you give to the characteristics of packaging when you shop for food? (answer all points)*

| | Molto importante/ *Very important* | Importante/ *Important* | Poco importante/ *Little important* | Per niente importante/ *Not important* |
|---|---|---|---|---|
| Colore / *Colour* | ❑ | ❑ | ❑ | ❑ |
| Forma / *Shape* | ❑ | ❑ | ❑ | ❑ |
| Praticità / *Convenience* | ❑ | ❑ | ❑ | ❑ |
| Resistenza / *Resistance* | ❑ | ❑ | ❑ | ❑ |
| Sicurezza / *Safety* | ❑ | ❑ | ❑ | ❑ |

**Figure 6: the questionnaire (cont'd)**



**Pensi che rispetto a 10 anni fa la sicurezza dei contenitori alimentari sia:**
*Do you think that with respect to 10 years ago, food packaging safety is*

| | | | | |
|---|---|---|---|---|
| ❑ Molto migliore / *much better* | ❑ Migliore / *better* | ❑ Uguale / *same* | ❑ Peggiore / *worse* | ❑ Molto peggiore / *much worse* |

**In caso di un problema associato ad un contenitore alimentare, da chi vorresti ricevere informazioni in proposito?** *(solo 1 risposta)*
*In case of a problem associated with packaging, from whom would you like to receive relevant information? (only 1 answer)*

| | |
|---|---|
| ❑ Giornali, televisione, radio/ *Newspapers, TV, radio* | ❑ Produttori alimentary/ *Food producers* |
| ❑ Autorità pubbliche/ *Public authorities* | ❑ Associazioni consumatori/ *Consumer Associations* |
| ❑ Scienziati/ *Scientists* | ❑ Supermercati – negozi/ *Supermarkets- shops* |

**Cosa ne pensi dell'impiego di simulazioni col computer come strumento di aiuto per l'indagine della sicurezza dei contenitori alimentari?**
*What do you think of the computer simulations as helping instrument to investigate safety of food packaging?*

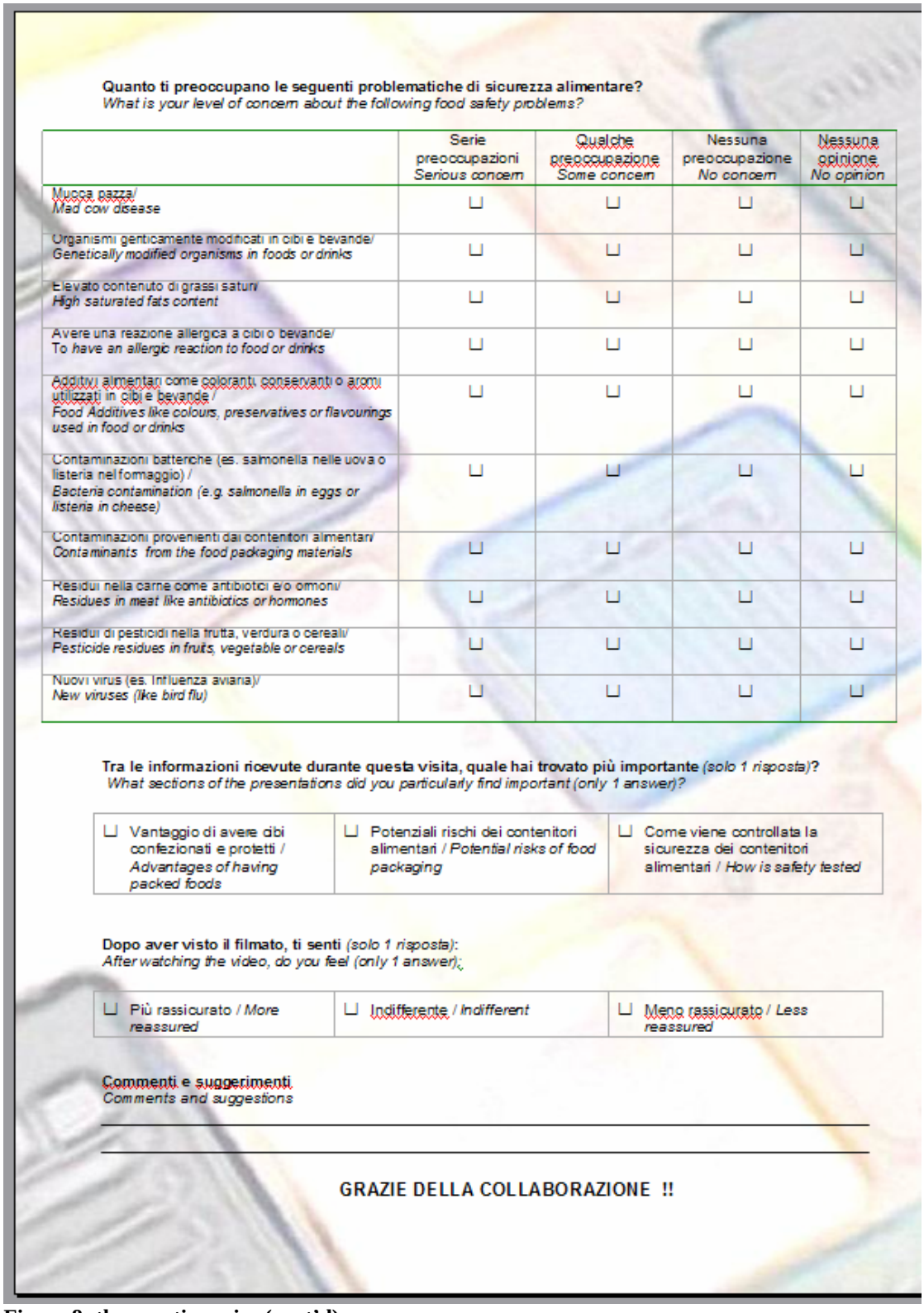
| | | | | |
|---|---|---|---|---|
| ❑ Completamente favorevole / *Completely favorable* | ❑ Favorevole / *Favorable* | ❑ Parzialmente Favorevole/ *Partially favorable* | ❑ Contrario/ *Opposite* | ❑ Completamente contrario / *Completely opposite* |

**Secondo te quanto può essere importante l'impiego di simulazioni al computer per** *(rispondere a tutti i punti)*:
*How important do you think the help of computer simulations are to (answer to all points):*

| | Molto importante/ *Very important* | Importante/ *Important* | Poco importante/ *Little important* | Per niente importante/ *Not important* |
|---|---|---|---|---|
| Migliorare la sicurezza dell'imballaggio alimentare/ *Improve food packaging safety* | ❑ | ❑ | ❑ | ❑ |
| Fornire uno strumento di supporto allo scienziato/ *Provide an instrumental support to science* | ❑ | ❑ | ❑ | ❑ |
| Individuare più rapidamente i casi peggiori/ *Point out more quickly worst case* | ❑ | ❑ | ❑ | ❑ |
| Migliorare l'impatto ambientale riducendo la quantità di solventi utilizzati in laboratorio/ *Improve the environmental impact by reducing the amount of solvent used in the lab and solvent waste* | ❑ | ❑ | ❑ | ❑ |
| Scegliere il contenitore più adatto per ogni alimento/ *Choose a better container for each type of food* | ❑ | ❑ | ❑ | ❑ |

**VOLTARE PAGINA**

**Figure 7: the questionnaire (cont'd)**



**Quanto ti preoccupano le seguenti problematiche di sicurezza alimentare?**
*What is your level of concern about the following food safety problems?*

| | Serie preoccupazioni *Serious concern* | Qualche preoccupazione *Some concern* | Nessuna preoccupazione *No concern* | Nessuna opinione *No opinion* |
|---|---|---|---|---|
| Mucca pazza/ *Mad cow disease* | ❑ | ❑ | ❑ | ❑ |
| Organismi geneticamente modificati in cibi e bevande/ *Genetically modified organisms in foods or drinks* | ❑ | ❑ | ❑ | ❑ |
| Elevato contenuto di grassi saturi *High saturated fats content* | ❑ | ❑ | ❑ | ❑ |
| Avere una reazione allergica a cibi o bevande/ *To have an allergic reaction to food or drinks* | ❑ | ❑ | ❑ | ❑ |
| Additivi alimentari come coloranti, conservanti o aromi utilizzati in cibi e bevande / *Food Additives like colours, preservatives or flavourings used in food or drinks* | ❑ | ❑ | ❑ | ❑ |
| Contaminazioni batteriche (es. salmonella nelle uova o listeria nel formaggio) / *Bacteria contamination (e.g. salmonella in eggs or listeria in cheese)* | ❑ | ❑ | ❑ | ❑ |
| Contaminazioni provenienti dai contenitori alimentari/ *Contaminants from the food packaging materials* | ❑ | ❑ | ❑ | ❑ |
| Residui nella carne come antibiotici e/o ormoni/ *Residues in meat like antibiotics or hormones* | ❑ | ❑ | ❑ | ❑ |
| Residui di pesticidi nella frutta, verdura o cereali/ *Pesticide residues in fruits, vegetable or cereals* | ❑ | ❑ | ❑ | ❑ |
| Nuovi virus (es. Influenza aviaria)/ *New viruses (like bird flu)* | ❑ | ❑ | ❑ | ❑ |

**Tra le informazioni ricevute durante questa visita, quale hai trovato più importante** *(solo 1 risposta)*?
*What sections of the presentations did you particularly find important (only 1 answer)?*

| | | |
|---|---|---|
| ❑ Vantaggio di avere cibi confezionati e protetti / *Advantages of having packed foods* | ❑ Potenziali rischi dei contenitori alimentari / *Potential risks of food packaging* | ❑ Come viene controllata la sicurezza dei contenitori alimentari / *How is safety tested* |

**Dopo aver visto il filmato, ti senti** *(solo 1 risposta)*:
*After watching the video, do you feel (only 1 answer):*

| | | |
|---|---|---|
| ❑ Più rassicurato / *More reassured* | ❑ Indifferente / *Indifferent* | ❑ Meno rassicurato / *Less reassured* |

**Commenti e suggerimenti**
*Comments and suggestions*

GRAZIE DELLA COLLABORAZIONE !!

**Figure 8: the questionnaire (cont'd)**

## Results on consumer associations of Lombardia region

A meeting was organised with consumer associations of the Lombardia region. There were about 35 representatives of the following consumer's Associations (see list in Annex):

- ADOC: Associazione per la Difesa e l'Orientamento dei Consumatori
- ADUSBEF: Associazione Difesa Utenti Servizi Bancari E Finanziari
- FEDERCONSUMATORI

The meeting objective was to initiate an interaction and test the consumer questionnaire on consumer protection representatives.

The first part of the meeting was focused on an introduction to packaging materials and their protective functions for food safety. Contact with food and possible migration processes, consumer safety and safety food packaging, were explained in detail. Specific examples of work carried in the contest of EU projects, directly either for the European Commission or for the European Food Safety Authority (EFSA) were also illustrated as examples.

The situation of the EU project FOODMIGROSURE with its WP7, as well as the JRC Open Day as a good occasion to investigate consumers acceptance of migration modelling versus chemical measurements was introduced.

The consumer associations were then explained the structure of the Open Day and showed the planned Tour programme, and explained the video in the context of the visit.

A brainstorming session with participants ensued in order, to receive input and suggestions for carrying out polling during the open day. The consumer associations then were used a test subjects for the first run of the polling design.

The most striking was that the video generated many positive comments. In particular, the effort to come across towards consumers and to communicate science to public in a simple manner was the trait of the polling that was most appreciated.

The draft questionnaire was also filled by participants. The template of the questionnaire and the phrasing of the questions were then discussed and implemented further. In particular, the question template was harmonised further between questions, and it was asked whether it makes sense or not to ask such complicate issues (e.g. those about computer simulation) to unaware people. The average time taken to fill the questionnaire was circa 4 minutes.

The results obtained based on consumer associations are detailed in the following paragraphs.

## *People profiles*

### The distribution of gender.

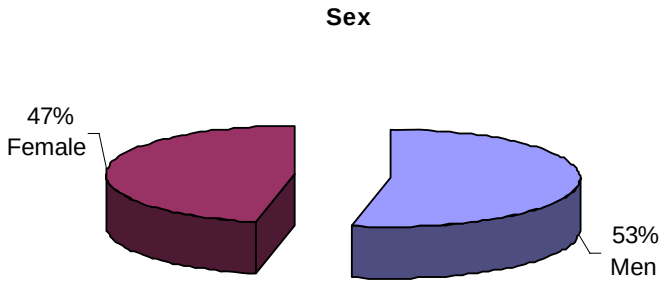



**Figure 9: distribution of gender in % of visitors**

This was quite well distributed among men and women

### The distribution of age categories

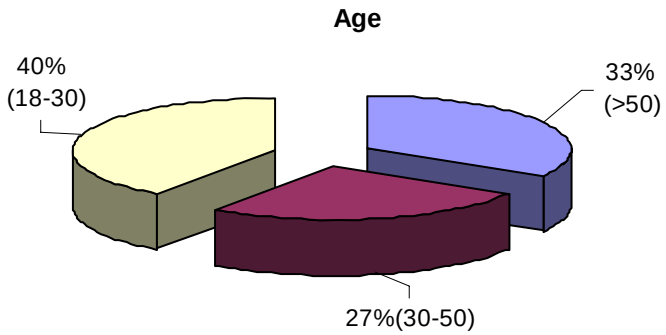



**Figure 10: distribution of age categories % of visitors**

## The distribution of occupation (professional)

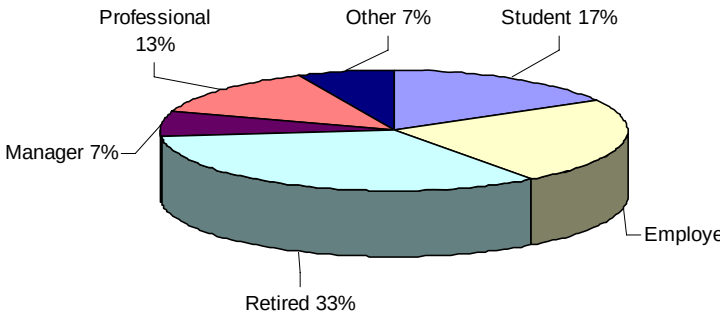



**Figure 11: distribution of professional occupation by % visitors**

## *Responses to the specifics*

## Knowledge on the topic

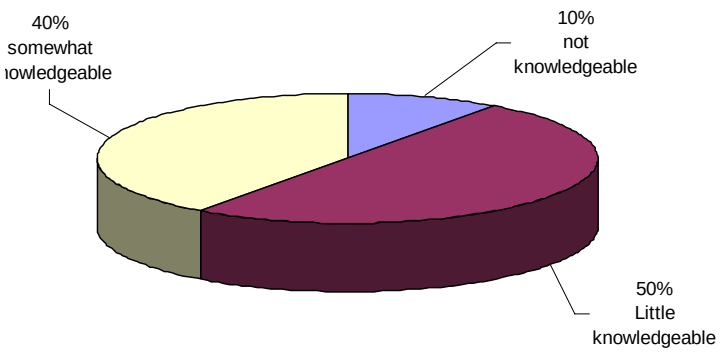



**Figure 12: distribution of knowledge with regards to packaging safety.**

## Determinants when shopping

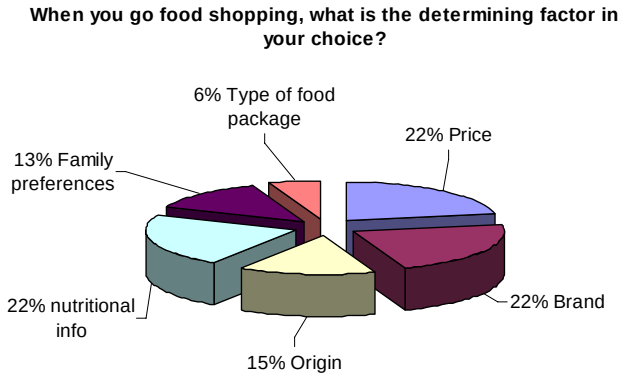



**Figure 13: distribution of determinant for choice when food shopping, by % visitors**

## Importance of characteristics of packaging

In terms of importance to characteristics of the packaging when shopping for food, people considered safety the most important, followed by resistance and convenience as important. Shape and colour were not considered important.

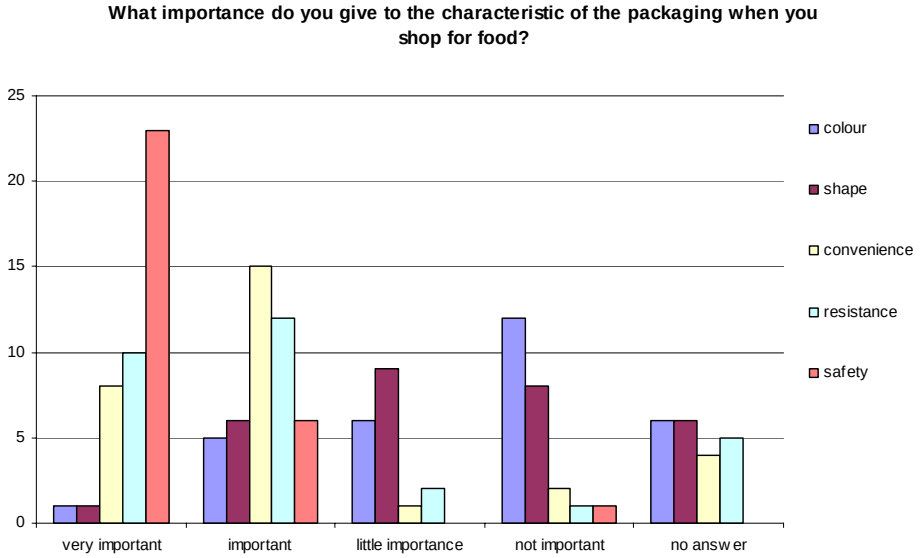



**Figure 14: Importance of characteristics of packaging**

## Packaging safety evolution over the last ten years

On the question of food packaging safety evolution over the last 10 years, the answer was that safety was considered by 100% of the people better or much better than 10 years ago.

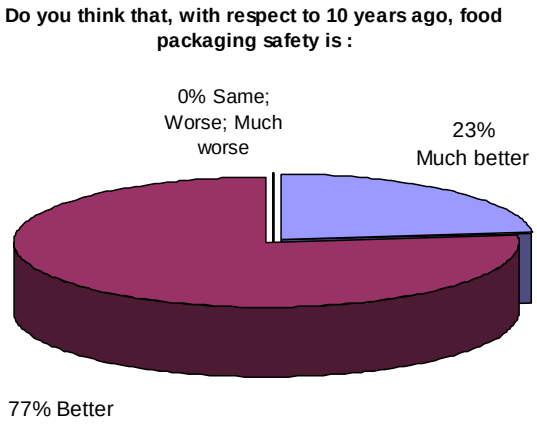



**Figure 15: Packaging safety evolution over the last ten years**

## Problem with packaging and trusted source of information

On the question of in case of a problem associated with packaging and whom who one trusts for information, the answer showed that **that people would like to receive relevant safety related information primarily from scientists**, followed by public authorities and newspaper/TV, followed by consumer associations and last by food producers or supermarkets.

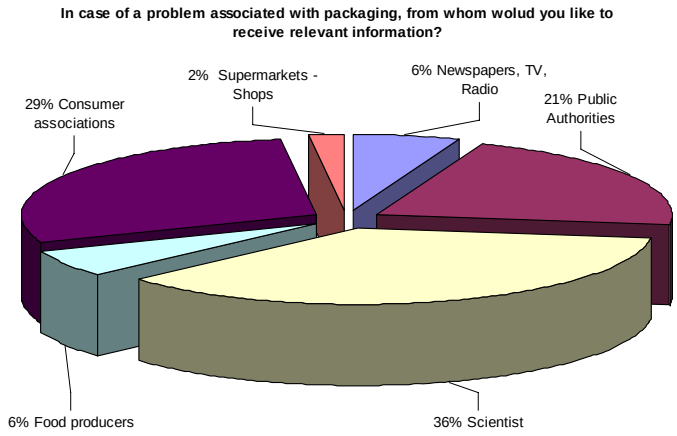



**Figure 16: Problem with packaging and trusted source of information**

## Use of modelling as helping tool to investigate safety food packaging

On the question of an opinion on the use of modelling as helping tool to investigate safety food packaging, almost 90% people were either favourable or strongly favourable to modelling when they understood what it meant; only 3% were against.

Question: What do you think of the computer simulations as helping instrument to investigate safety of food packaging?
Keys:
1: completely opposite
2: opposite;
3: fairly favorable;
4: favorable;
5: very favorable
[expressed in number of people.]

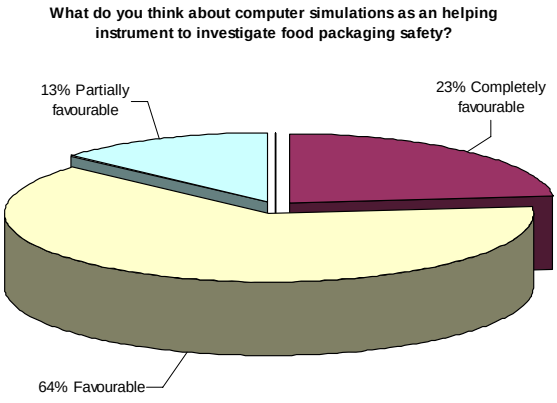
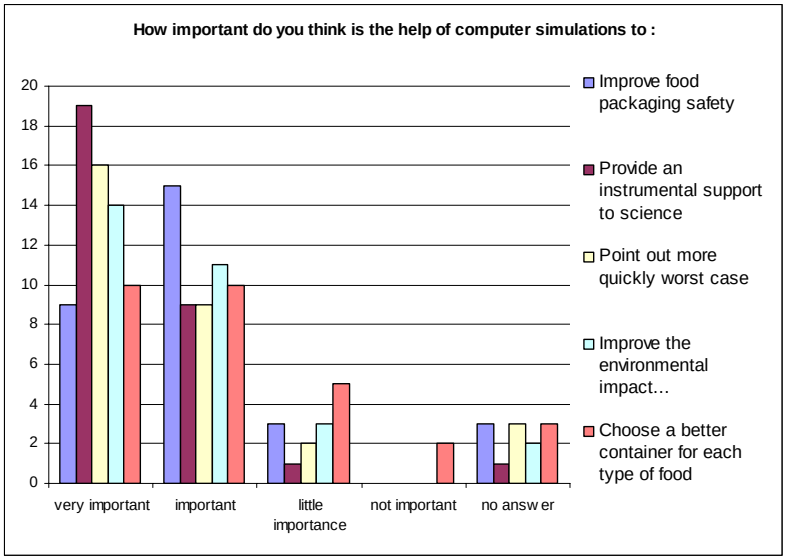



**Figure 17: opinion on the use of modelling as helping tool to investigate safety food packaging**

The data also reflected comments obtained by focus groups, which was a completely different approach with no prior risk education

## Relevance of computer simulation as tool

The questionnaire then gave a choice of a number of reasons commonly used regarding the relevance of the use of such computer simulations. People had to rank each reason as a function of personal perceived importance.

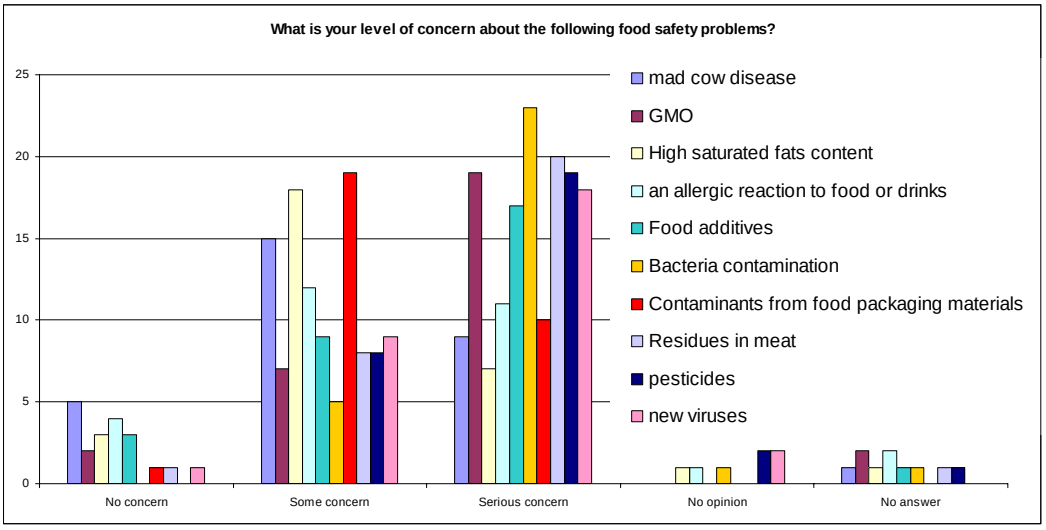



Question: How important do you think the help of computer simulations are to (answer to all points): (expressed in % people)

**Figure 18:relevance of the use of such computer simulations**

In this question, it is highlighted that pointing out worst case and support to science are the major relevant points for the consumer associations.

The questionnaire ended with a series of 10 food risks to be ranked from no concern to high concern. **The level of concerns of citizen towards packaging showed that packaging contaminants were perceived much like food additives,** whereas higher concerns are still towards microbiological contaminations, antibiotics /hormones in meat, pesticides in fruits and vegetables and new viruses like bird flu.




Question: What is your level of concern about the following food safety problems? (expressed in % people)

**Figure 19: series of 10 food risks to be ranked from no concern to high concern**

This showed that packaging contaminants are perceived like food additives, whereas higher concerns are still towards microbiological contaminations, antibiotics /hormones in meat, pesticides in fruits and vegetables and new viruses like bird flu.

## Relevance of Q&A and interactions with the scientists

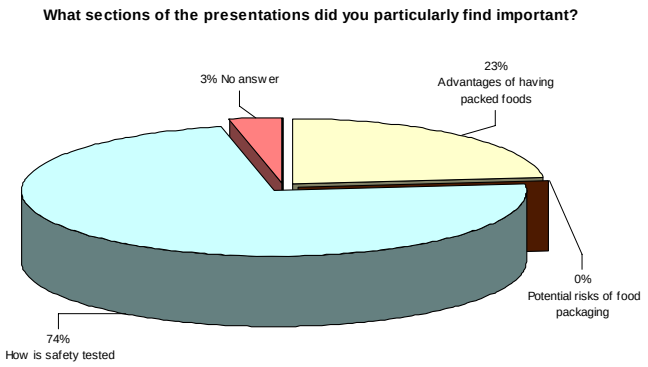



**Figure 20: question on the relevance importance of information**

People in the overwhelming majority -both for this questionnaire approach and for the focus group approach- felt much reassured regarding the safety of packaging simply from the fact that they did not previously know that such research and controls existed. Most spontaneous written comments were to have this type of research much more visible at the level of both consumer associations and consumers themselves. People were also extremely enthusiastic and grateful for experiencing an entertaining science short production, and made enthusiastic comments on the humanity and added-value the initiative represented for the consumer's understanding of science.

# Results of the open day and citizens' polling

## *General statistics on the polling*

The maximum capacity was 40 people per 12 min. for 7.5 hours (hours 10:00-17:30), i.e. 450 min., thus about 30-37 tours, equivalent to a total of a maximum of 1500 people.

It is estimated that the number of visitors was close to 1400; We collected 700 questionnaires filled, as one was given per family unit on average,

Out of the 700 questionnaires, 30% contained a comment even though it was optional to do so. The comments were collected and the most common ones are reported in Annex 4.

It can be estimated that about 20% of visitors were children.

The event is shown in pictures then the analysis of results are presented.

The welcome both and entrance sign



The posters and the art totem as attraction and stimulus during wait time

Staff and guides, including consumer association representatives





The show room

Arrivals by bus and entrance views


typical tour and visit.: show and laboratory visits


Compilation of questionnaires

## *Results of people profiles*

The data allowed us to have specific information on our visitors, as illustrated below.

### The distribution of nationalities.

The visitors were in the vast majority Italian, but there other nationalities were also represented (figure 1)

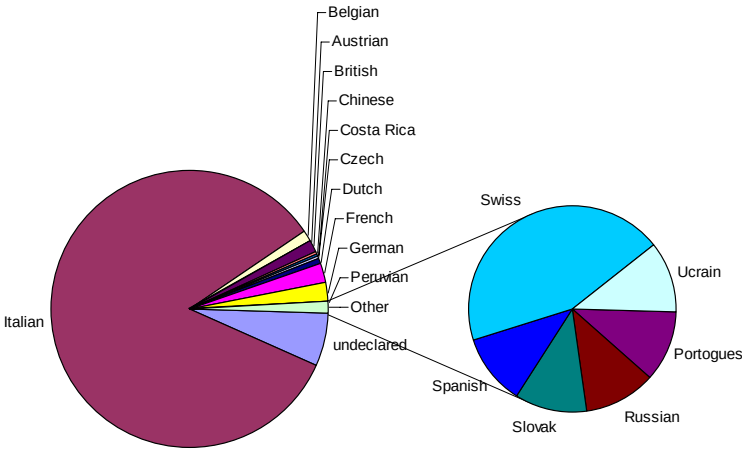



**Figure 21: distribution of nationalities % of visitors (open day)**

### The distribution of gender.

This was quite well distributed among men and women

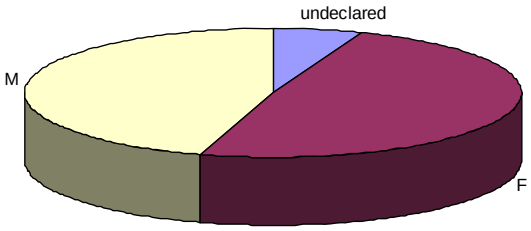



**Figure 22: distribution of gender in % of visitors**

## The distribution of age categories

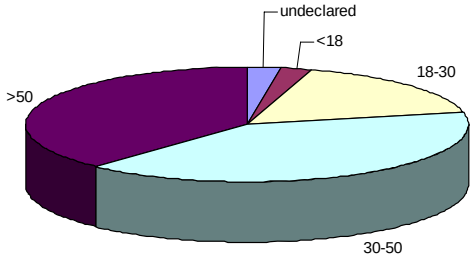



**Figure 23: distribution of age categories % of visitors**

## The distribution of occupation (professional)

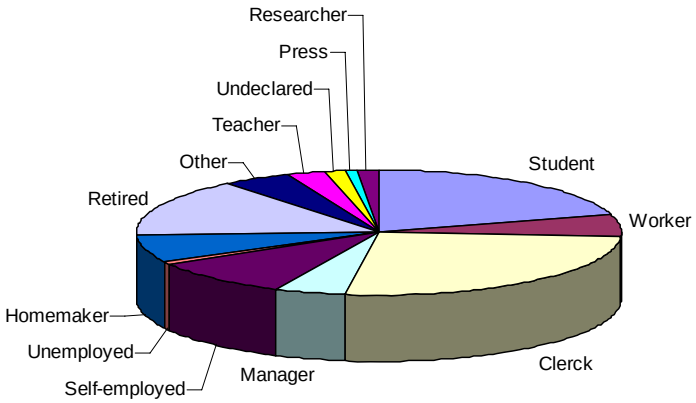
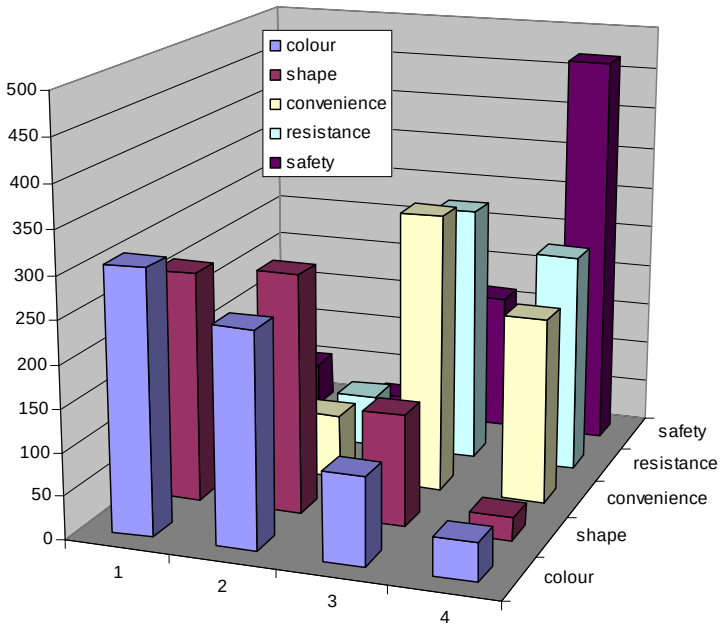



**Figure 24: distribution of professional occupation by % visitors.**

## *Responses to the specifics*

In terms of importance to characteristics of the packaging when shopping for food, people considered safety the most important, followed by resistance and convenience as important. Shape and colour were not considered important.




Question:
What importance do you give to the characteristics of the packaging when you shop for food?

Keys:
1: not important –
2: little important;
3: important;
4: very important;
expressed in number of people.

**Figure 25: question on importance to characteristics of the packaging when shopping for food**

On the question of food packaging safety evolution over the last 10 years, the answer was that **safety was considered by 100% of the people better or much better than 10 years ago.**

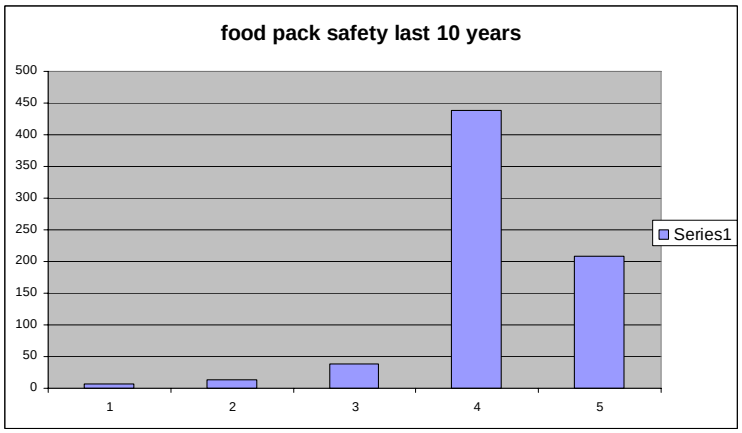



**Figure 26: question on food packaging safety evolution in the past 10 years**

Question: Do you think that with respect to 10 years ago, food packaging safety is

Keys:
1: much worse
2: worse
3: same
4: better
5: much better

On the question of in case of a problem associated with packaging and whom who one trusts for information, the answer showed that **that people would like to receive relevant safety related information primarily from scientists**, followed by public authorities and newspaper/TV, followed by consumer associations and last by food producers or supermarkets.

Question: In the case of a problem associated with packaging, from whom would you like to receive relevant information?

Key:
1: newspaper or TV;
2: public authorities;
3: scientists;
4:food producers;
5: consumer associations.

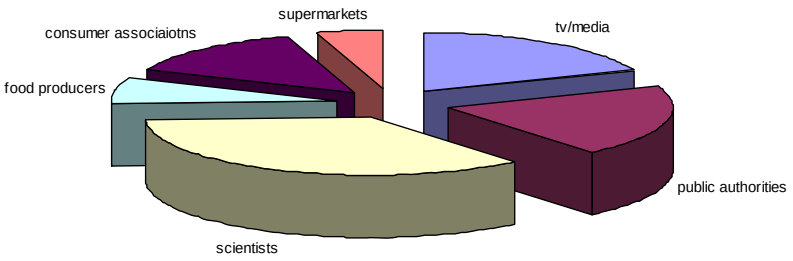



**Figure 27: question on problem associated with packaging and whom who one trusts for information**

On the question of an opinion on the use of modelling as helping tool to investigate safety food packaging, almost 90% people were either favourable or strongly favourable to modelling when they understood what it meant; only 3% were against.

Question: What do you think of the computer simulations as helping instrument to investigate safety of food packaging?
Keys:
1: completely opposite –
2: opposite;
3: fairly favorable;
4: favorable;
5: very favorable
[expressed in number of people.]

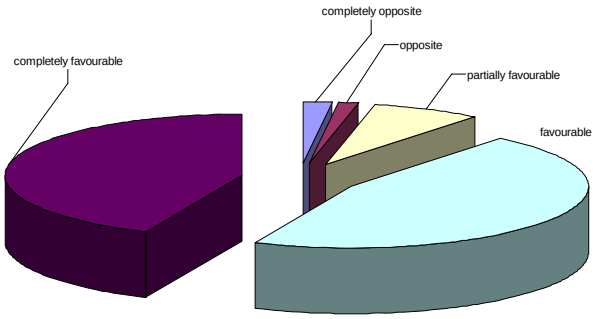



**Figure 28: question on opinion on the use of modelling as helping tool to investigate safety food packaging**

The data also reflected comments obtained by focus groups, which was a completely different approach with no prior risk education

The questionnaire then gave a choice of a number of reasons commonly used regarding the relevance of the use of such computer simulations. People had to rank each reason as a function of personal perceived importance.

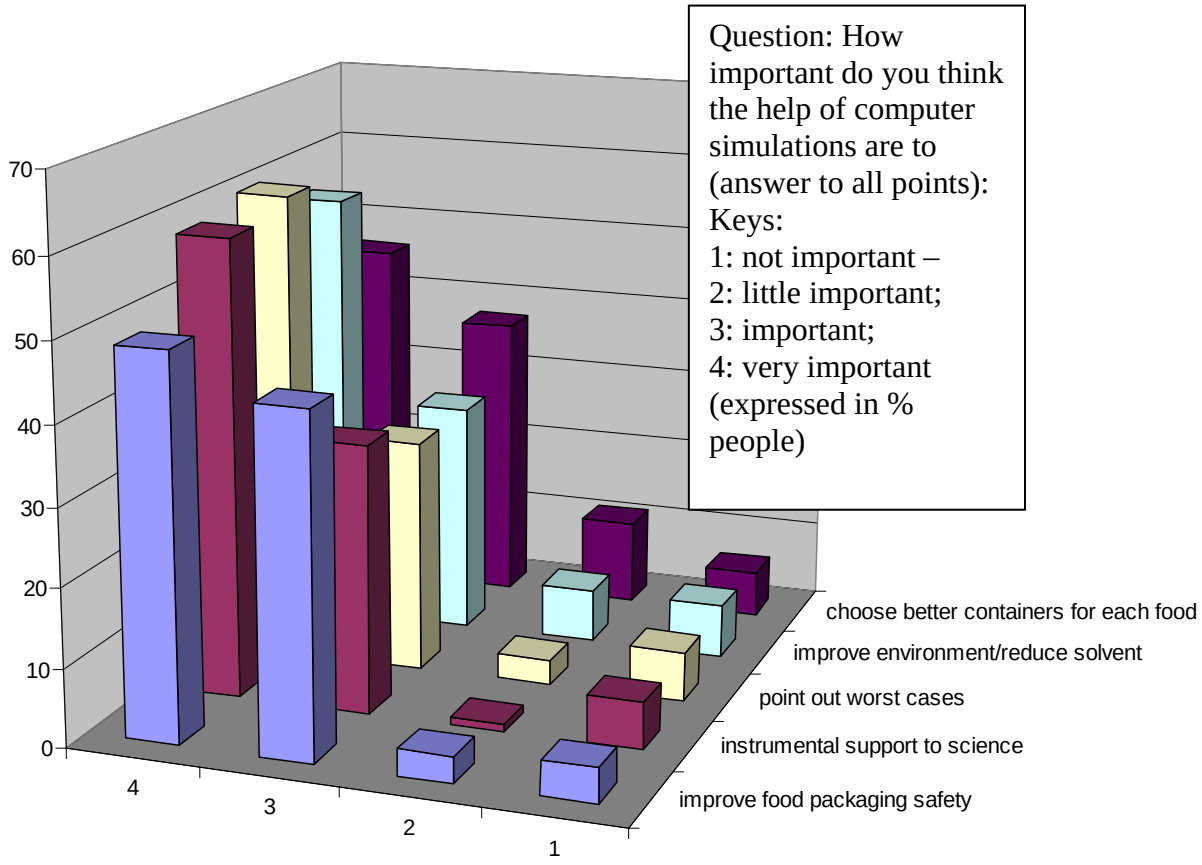



**Figure 29: question on the potential importance of the help by computer simulations for a variety of reasons/purposes**

In this question, it is highlighted that pointing out worst case and support to science are the major relevant points for the citizen.

The questionnaire ended with a series of 10 food risks to be ranked from no concern to high concern. **The level of concerns of citizen towards packaging showed that packaging contaminants were perceived much like food additives,** whereas higher concerns are still towards microbiological contaminations, antibiotics /hormones in meat, pesticides in fruits and vegetables and new viruses like bird flu.

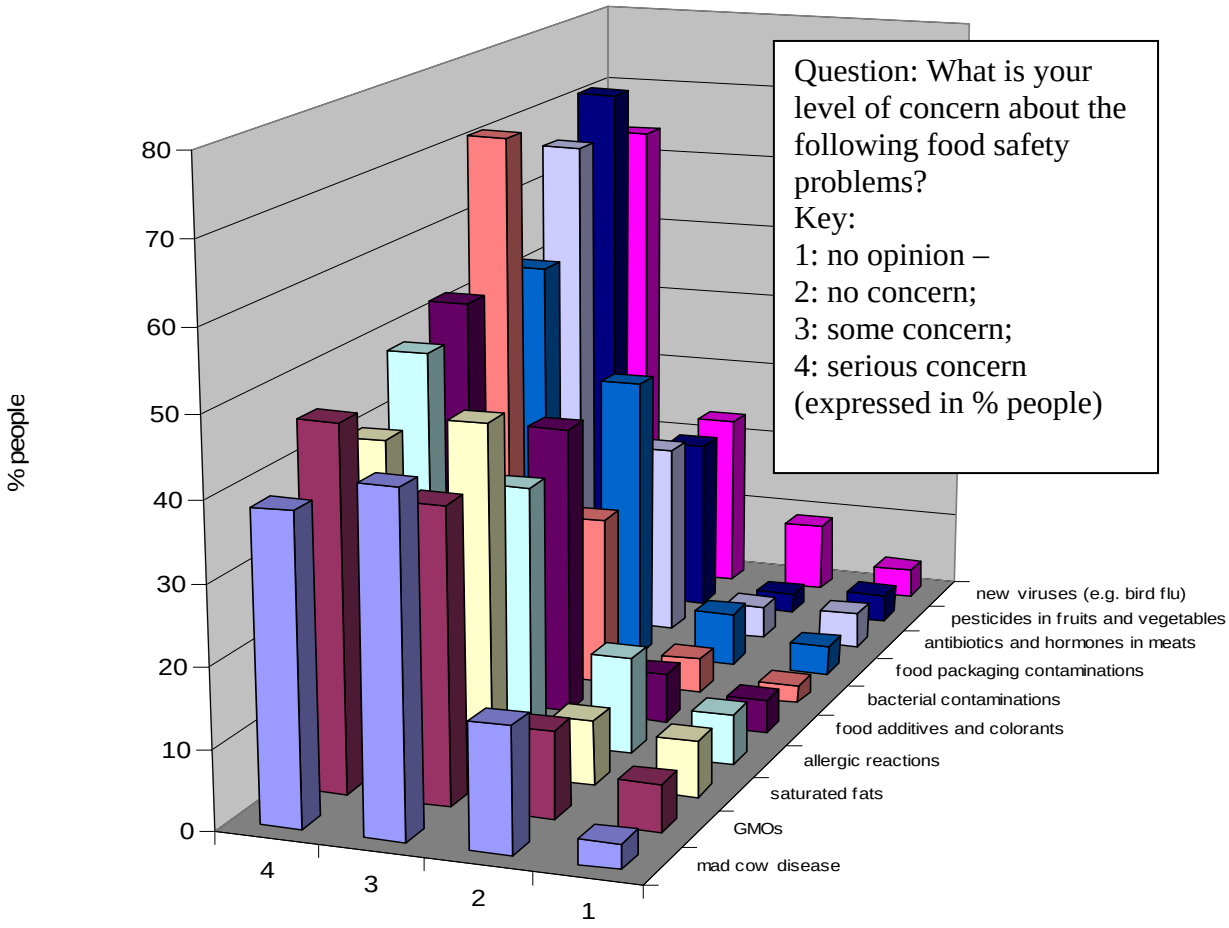
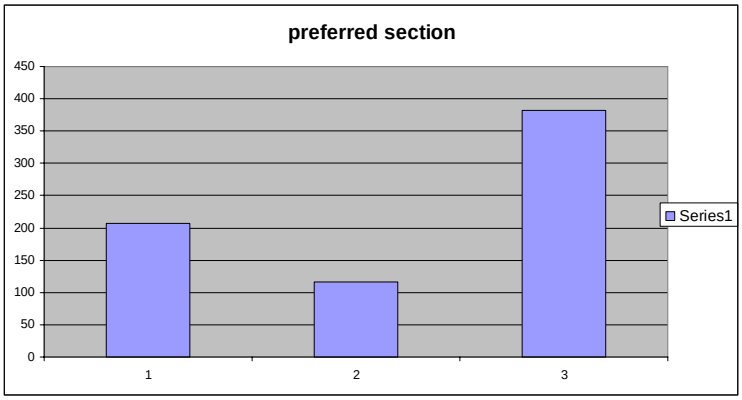



**Figure 30: question on ranking 10 food risks from no concern to high concern.**

This showed that packaging contaminants are perceived like food additives, whereas higher concerns are still towards microbiological contaminations, antibiotics /hormones in meat, pesticides in fruits and vegetables and new viruses like bird flu.

The final questions were related to what sections were found most important during the visit: from the answers, learning about the safety mechanisms in place for testing and controlling compliance of food contact materials was the most important. The comments made reflected that the reason why this was found so important was that it is too little visible. Specific comments related to alarmists news or unnecessary worries that can appear in the media and where the consumer would like to have reassurance, by any means, and especially trusted sources like scientists or people in the laboratory in general.




Question: What sections of the presentations did you particularly find important?
1: advantage of packed foods;
2: potential risks of food packaging;
3: how safety is tested.

**Figure 31: question on information received of most importance**

The eagerness of being informed was also reflected in the final response, as generally speaking for all means of testing consumer

attitude (either by polling or by focus groups), consumers felt very much reassured, regardless of the means of testing employed.

This was also reflected by the spontaneous comments received, such as:

> *"The science for the safety of the consumer" or "make this research more visible". Etc.*

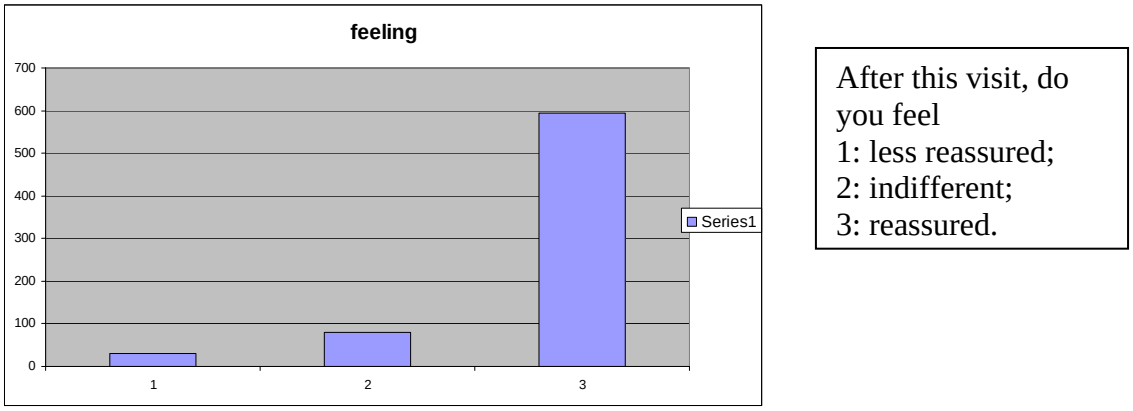



**Figure 32: question on consumers reassurance**

People in the overwhelming majority -both for this questionnaire approach and for the focus group approach- felt much reassured regarding the safety of packaging simply from the fact that they did not previously know that such research and controls existed. Most spontaneous written comments were to have this type of research much more visible at the level of both consumer associations and consumers themselves. People were also extremely enthusiastic and grateful for experiencing an entertaining science short production, and made

enthusiastic comments on the humanity and added-value the initiative represented for the consumer's understanding of science.

## Conclusions

The responses were echoing quite interestingly many answers also obtained in the focus group, although a completely different methodology. There is a fundamental trust from the public in the scientists to distinguish and understand safety issues. The consumer wants sincerely to be approached and informed by scientists for this reason and is also ready to favour new approaches such as migration modelling if it can be an additional tool for better consumer protection. However, the consumer needs to be sure that at the root for use are experimental data which demonstrate the applicability of the model.

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The supporting documents for this chapter are in Annex 4

# Phase 5 : Qualitative questionnaires for stakeholders

## Introduction

In the last phase, more specific technical questionnaire was directed to end-user of modelling, which was mailed to a variety of stakeholders such as National Reference Laboratories, commercial laboratories, industries, EFSA, CEN members etc.

## Approach and design

The questionnaire was developed by the plenary of partners of the FOODMIGROSURE project across the first 2 years.

The final version is presented below:

**Experimental: questionnaire**

Questionnaire for member states and stakeholders on the implementation of Directive 2002/72/ec on materials and articles in contact with foodstuffs, with special regards to the use of mathematic modelling.

Who are you:
MS Competent authority
NRL
Food safety authority
CEN participant
Other

Institute responding here:
Contact person:
Contact address:
Contact phone
E-mail address:

The questionnaire has the following objectives
To describe the experiences of Member States in awareness of mathematical modelling to predict migration
To identify issues that have come up in using such models
To make recommendation on how to use the model

| National Legislation and practices |
| --- |
| Is modelling allowed<br>If yes :<br>To a lesser extent than Directive 2002/72/EC<br>To the same extent as Directive 2002/72/EC<br>To a greater extent than Directive 2002/72/EC |
| Do you have any more specific measures relating to the use of modelling? |
| Have there been problems with the interpretation 2002/72/EC in this domain?. If yes please give details. |

| Use of modelling |
| --- |
| I you heard or been involved in any activity related to the use of modelling ; if so please provide details. |
| What was the outcome in positive points and negative points. |
| In the recent years, have there been issues where you were involved or heard of where modelling was used. |
| If you use modelling or seen/heard modelling used, was it for:<br>Compliance<br>Enforcement<br>Research<br>Comment please: |

How many times have you come across modelling being used in 2004 and 2005 and 2006*

| | 2004 | 2005 | 2006 (so far) |
|---|---|---|---|
| 1-5 | | | |
| 6-10 | | | |
| 11-30 | | | |
| 31-50 | | | |
| 51-100 | | | |
| >100 | | | |

*EFSA: how many dossier do you receive with modelling
% of overall number of dossier per year (2004; 2005; 2006)

If so, when the model was used was it and/ or could they tell whether it was used correctly

Who did most used modelling
Industry
Third party labs
Enforcement

Who does third party testing in your country? (list)

Which software do you use or know was used for migration modelling

| | 1 (less often) | 2 | 3 (most often) |
|---|---|---|---|
| My own | | | |
| Migratest (lite) | | | |
| Inramig (smewise multiwise etc) | | | |
| Sml 1.0 | | | |
| other | | | |

comments

What is your experience comparing to migration experiments:
do you have the impression that that modelling:

| | Impression | | | evidence | | |
|---|---|---|---|---|---|---|
| | Little | Medium | strong | Little | Medium | strong |
| Overestimate | | | | | | |
| Producing same results | | | | | | |
| Underestimate | | | | | | |
| | | | | | | |

What is your confidence in modelling (circle)
Not confident – medium confidence- strong confidence

Do you think that modelling can be used to register new substances

Do you use modelling to support your own results (e.g. false negatives etc)

Do you think the future use is towards
Exposure estimates (e.g. in simulants)
multilayer approach

If working with modelling
which development do you think would be necessary
multilayer
food
practical example on market
support to practical experiments
exposure estimates on the basis of migration values

Additional comments

| |
|---|
| In your opinion, is modelling a useful tool for the prediction of migration from food contact materials. |
| In view of forthcoming extension of possibility of use (Practical Guide) what is your opinion on the use of modelling as it is now (an additional tool) in the following aspects (see table) |

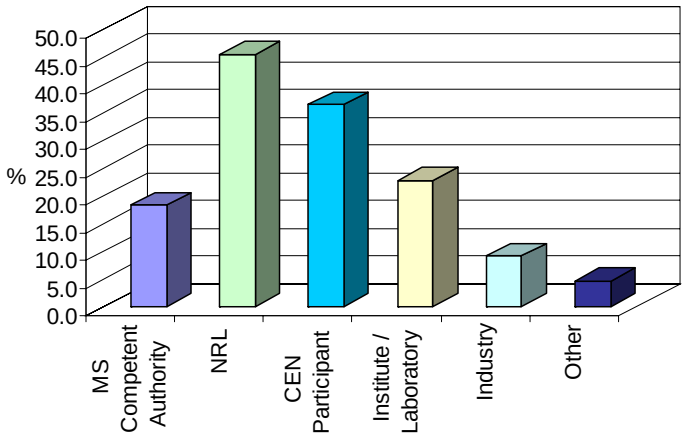
| | Very important | Important | Little important | Not important |
|---|---|---|---|---|
| Improve food packaging safety | | | | |
| Provide an instrumental support to science | | | | |
| Point out more quickly worst case | | | | |
| Improve the environmental impact by reducing the amount of solvent used in the lab and solvent waste. | | | | |
| Reduce the exposure of lab personnel to solvents | | | | |
| Choose a better container for each type of food | | | | |

Thank you

Catherine Simoneau
On Behalf of the Community Reference Laboratory for Food Contact Materials, and on behalf of the project FOODMIGROSURE.

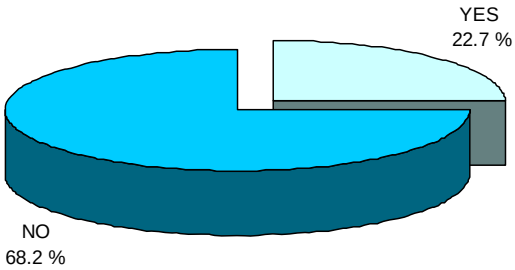
## Results

***Who are you?***




***Is modelling allowed? If yes:***

***Do you have any more specific measures relating to the use of modelling?***

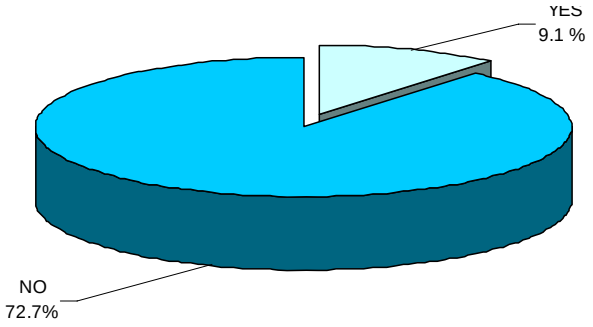



Comments related to answer YES on specific measures on the use of modelling:

- We use it only with high safety distance from the limits _ISEGA
- If predicted value from model is close to the SML, we recommend testing. If a substance is unfamiliar and not similar in structure to something already studied we recommend testing the first time and subsequently model_PIRA
- Difficulty in obtaining the input parameters_NRL DK

- Issue of how to be certain, that the given data in the documents are valid and relevant for the specific batch of FCM at hand. If for instance the references to the legislation are outdated, it is a sign to be cautious about statements of compliance: Samples are taken out for control_NRL DK
- Now we use measurements and not modelling through external laboratories_PENTAPLAST
- For the partition coefficient we fill in mostly 0 or 1. Information about the partition coefficient is useful_TNO NL
- Practical guide supporting 2002/72/EC_NOVELIS

***Have there been problems with the interpretation 2002/72/EC in this domain?***




The comments in cases for which the answer was NO were:

- Modelling can only be used for substances for which accredited experimental analysis exist (somewhere in Europe): The reason is, that in case a model calculation shows non-compliance, the result should be verified experimentally. This rule limits the use of modelling_NRL DK

- Problem multilayers film not taken into consideration(no legal regulation), legal regulations are not useful in practice. There are not regulations for microwave films_VKI AU

The comments in cases for which the answer was YES were:

- Directive does not point out the caveats associated with modelling (practical Guide does though). Also the term 'generally accepted' is somewhat vague_PIRA
- No experience in mathematical modelling, so we have not found interpretation problems-NRL CY

***Use of Modelling***

***I you heard or been involved in any activity related to the use of modelling ;***

- Estimation of specific migration to avoid tests_ ISEGA
- Provision of practical data to support modelling/project_PIRA
- Compliance testing against 2002/72/EC_PIRA
- Prediction of migration for potential new substance registration_PIRA
- As enforcement we do not know the composition of a plastic material. We first perform a screening of the plastic (ultrasound ether extraction). We analyse this in a semi-quantitative way. We

compare the amount of migrant in the extract to the SML or other restriction-VWA NL

- If we suspect the SML may be exceeded, we carry out an official migration test (according to EN 13130-8)_VWA
- Development of mathematical model for specific additives used by a packaging producer; it is a 2 years project, that is now starting_NRL PO
- we (my colleague Jens Højslev Petersen and I) have attended the Commissions 2-day course MM_NRL DK
- we have given a short course on MM to regional DK food inspectors_NRL DK
- we have conducted an enforcement campaign on MM in DK (2003-2004)_NRL DK
- currently I am a member of the EU task force on MM with regard to FCM_NRL DK
- In one of last year's dossiers modelling was used for the SML-calculation for the authorisation of a new R-PET(-technology)_NRL AU
- I have been involved in the evaluation of substances at EFSA where modelling had been perfomed_INRAN

- Project A03049, An investigation of functional barriers currently used by the food industry and an assessment of their efficacy (published March 2006)_FSA UK

- Project A03045, Identification of chemicals that could migrate into foodstuff from pigments and dyes and measurement of migration of these chemicals (published Sept 2005)_FSA UK
- Project A03021, Migration from recycled paper and board to dry foods. Research into the factors involved, leading to practical avoidance and amelioration measures (published Sept 2004)_FSA UK
- Yes, I heard from different institutions and make worse case calculation for theoretically values_PENTAPLAST
- The Swiss Federal Office of Public Health (Dr. V. Dudler) is actively participating at the development of a diffusion model: AKTS - SLM Software 4_MSCA CH
- We use modelling for the determination of migration of compounds for which the actual content is known. If the specific migration is less than the SML no migration tests are performed_TNO NL
- In some cases modelling is used for petition studies for the determination of the migration of impurities_TNO NL
- EAFA Study: Migration Investigation on Aluminium Laminates Part 1+ 2 _NOVELIS
- Discussion to enlarge Migratest to a coating test modelling soft ware_NOVELIS
- Participant on Workshops concerning modelling (Fabes)_NOVELIS
- Yes, I have used Migratest Lite in research projects to predict the extent of migration from defined materials/articles_UK NRL
- No practical experience_MSCA AU

- I have heard about Danish experience and I got Swiss program_NRL SL

***What was the outcome in <u>positive</u> points and <u>negative</u> points?***

The positive points evoked were:

- Simple to use software. Covers most applications for plastics . Does not underestimate in many cases therefore high degree of confidence in compliance evaluations_PIRA
- The positive point is that it can save you a lot of time on the laboratoryThe positive point is that it can save you a lot of time on the laboratory_VWA
- The use of the model avoids migration experiments in some (a lot of) situations_NRL PO
- Working with MM gives a better understanding of the theory of migration in plastics, at all levels: Should be a standard tool in the education of new people in the FCM area_NRL DK
- It is in principle possible to enforce a number of different substances in one campaign_NRL DK
- NEITHER-NOR, I accepted the results in my statement_NRL AU
- Outcome is positive if the hypothesis at the basis of modelling are very transparent and if uncertainties are considered_INRAN
- If the value is much lower than the limit in 2002/72/EC, confirmations are possible_PENTAPLAST

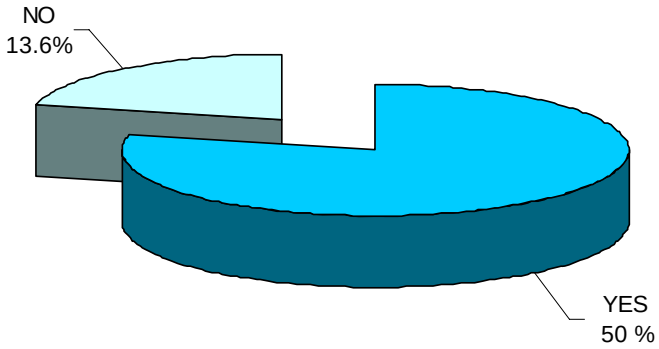
- Theory of modelling fit in general with the experimental found migration levels_NOVELIS
- The use of modelling reduced the number of migration tests that needed to be carried out. For those cases where the modelled migration was high or close to any legislative limits then migration into foods/food simulants was determined. In all cases the modelled migration exceeded the measured migration_NRL UK
- I heard presentation about Danish experiment. It seems very interesting. I don't know any negative pointsNRL SL

The negative points evoked were:

- It is often difficult to measure real CP0-values_ISEGA
- Real exposure is not the same like migration test with simulants(ITX)_ISEGA
- In some applications it overestimates by too much, for example at higher temperatures, so less useful for registration of new substances where migration could be into next tox bracket. No partition coefficients are available, therefore in many cases it is inaccurate for aqueous simulants. Not useful for crosslinked polymers, ionic compounds or antistats_PIRA
- Negative is that our screening method and also the mathematic modelling can only be used to demonstrate compliance. For enforcement, we must demonstrate that a limit is exceeded. This always requires testing on the lab_VWA
- The development of the model requires a considerable amount of experimental work_NRL PO

- Very difficult to obtain information on substances and concentrations, needed as input to the model_NRL DK
- The model would never be able to discover unforeseen problems with non-intentionally added substances_NRL DK
- So far only for mono-layer materials: Very limited use_NRL DK
- If the value is near to the limit than we do tests_PENTAPLAST
- Complexity for multilayer laminates, Transferability from one to another coating system is not possible_NOVELIS
- More work has to be done to receive the specific Diffusion coefficients_NOVELIS

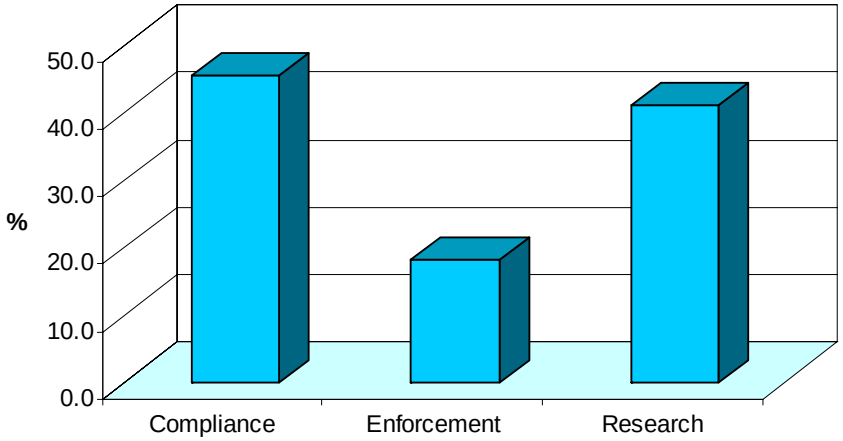
***In the recent years, have there been issues where you were involved or heard of where modelling was used***




In cases in which the answer was YES, often specific comments were added as reported below:

- Yes for evaluation of specific migrations_ISEGA
- YES – cases for compliance evaluation, where substance was a mixture_PIRA
- Only in a pragmatic approach: if, assuming a worst case 100% migration, the SML is not exceeded, no testing is necessary_VWA
- Modelling is a tool to make it easier/cheaper for industry to deal with expected harmonised legislation on multilayer materials, paper and board etc_NRL DK
- As I know, modelling is used only at the "ofi", Austrian Research Institute for Chemistry and Technology in Austria_NRL AU
- Overall impression that use of mathematical modelling is becoming more common_FSA UK
- Development of the diffusion model : AKTS - SML Sotfware 4_MSCA CH
- The first time I have heard or read about modelling was in ISPRA CRL,NRL's meeting and when I have read the Practical Guide (but only informatively)_NRL CY
- Modelling by Dr. Rossi_VKI AU
- I have heard about Danish experience with health inspectors and I know that in Switzerland colleagues have also developed their model_NRL SL

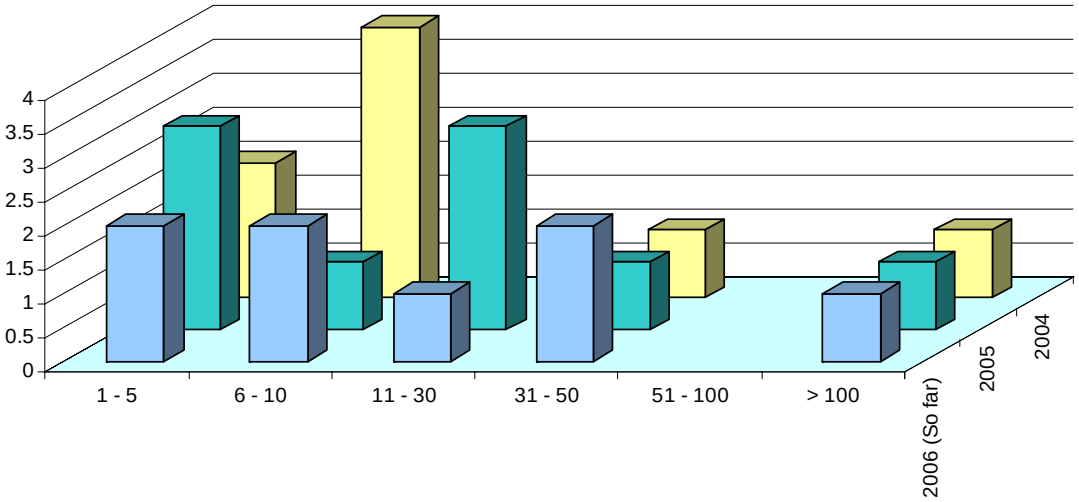
***If you use modeling or seen/heard modeling used, was it for:***




The comments made for this questions were:

- Mostly for compliance, but also to give manufacturers of new substances an idea on the extent of migration (and therefore what toxicological range) would be likely for their substance under a variety of scenarios. This saves a lot of time (and testing costs) for development of new materials_PIRA
- No experience_RIVM
- To some extent in collaboration with Danish university_NRL DK
- It is part of an application we pt. are doing on nano-materials_NRL DK
- Research in our office (Swiss Federal Office of Public Health)
- Compliance by the industries who bought the AKTS - SML Software 3_MSCA CH
- I have used modelling for research purposes only. I have heard of modelling being used for compliance and enforcement_NRL UK

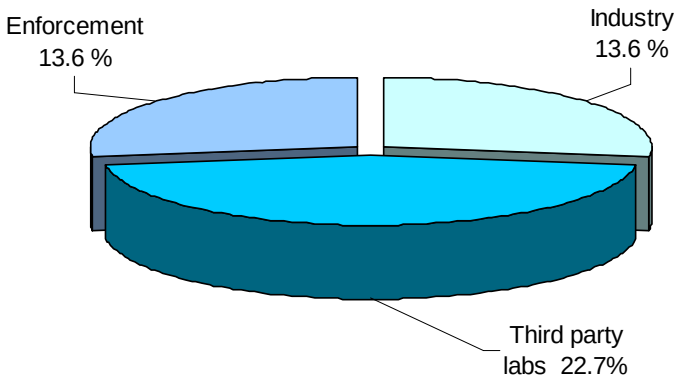
***How many times have you come across modeling being used in 2004 and 2005 and 2006 ?***




Only one comment was reported:

Apart from research projects mentioned above, it is often mentioned in the literature but not kept a tally_FSA UK

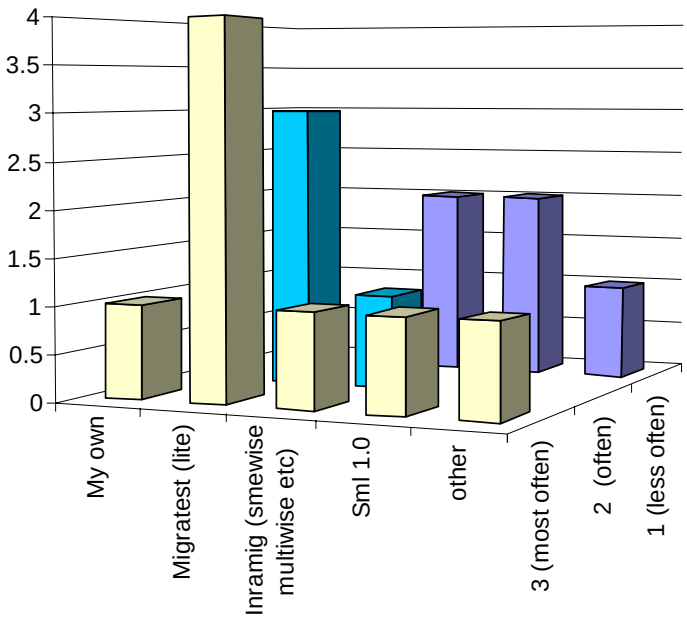
***Who did most used modelling?***



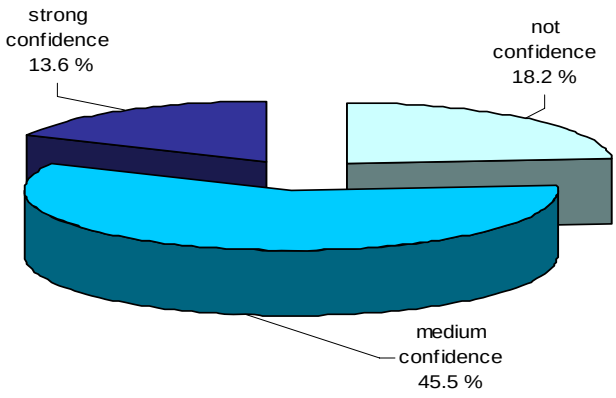
***Who does third party testing in your country?***

- My Institute_ISEGA
- PIRA RAPRA_PIRA
- TNO SGS_VWA
- TNO zeist_RIVM
- No one_NRL DK
- "ofi", Austrian Research Institute for Chemistry and Technology _NRL AU
- Independent laboratories are those such as Central Science Laboratory, Pira, Rapra, Leatherhead Food International, Camden & Chorleywood_FSA UK
- Kantonal Laboratory, RCC (Ittigen), SQTS_ MSCA CH
- Nobody_NRL SK
- FABES Forschungs-GmbH_NOVELIS
- Nobody_NRL CY
- PIRA RAPRA and some public analyst laboratories_NRL UK
- Umweltbundesamt_VKI AU
- Our institute and regional institute in Maribor_NRL SL

***Which software do you use or know was used for migration modeling ?***

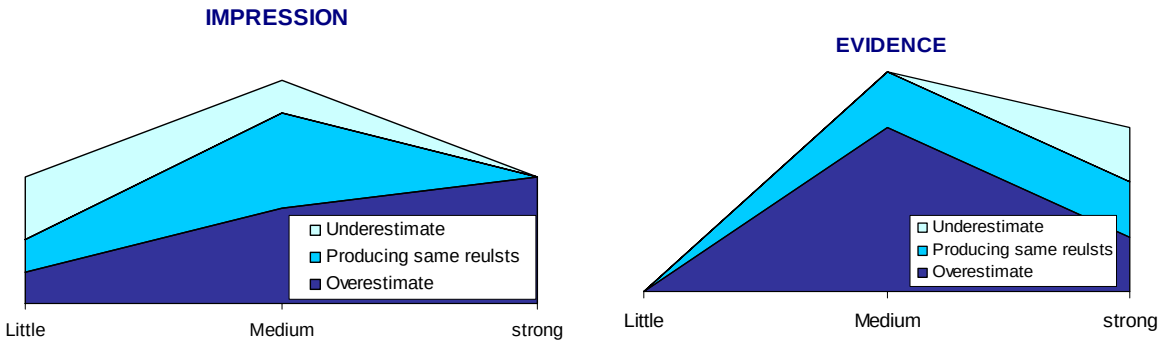



***What is your confidence in modelling ?***

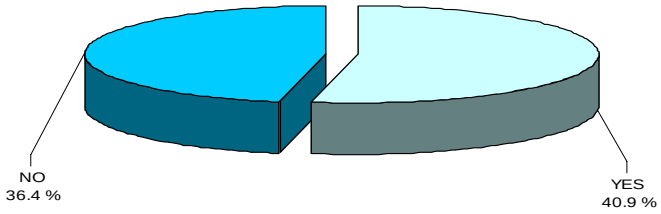


***What is your experience comparing to migration experiments:***

***Do you have the impression that that modeling:***




***Do you think that modeling can be used to register new substances ?***




In cases in which the answer was YES, often specific comments were added as reported below:

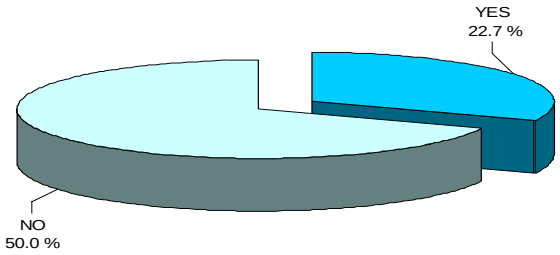
- Yes, but some migration/kinetic data should be provided to prove that migration is diffusion controlled and overestimates_PIRA
- Yes if can be demonstrated that they give an overestimation and that predicted migration is well below any legal limits_FSA UK
- At this time when our lab hasn´t experiences with using of mathematic modelling I can´t answer but I think that yes_ NRL SK

- We have no experience. However, we think that modeling could be used to register new substances but it must be based on scientific evidence_NRL PL
- Yes, however for the registration of new substances always a validated method for compliance testing should be included. To include 1 sample in the validation is not very much additional work and is in most cases included in the study_TNO NL

In cases in which the answer was NO, often specific comments were added as reported below:

- You need experience about the migration of new substances_ISEGA
- I think migration testing is always necessary. The model is not scientifically sound, only based on emperical data. For new substances therefore new data must be generated in order to be put in this model_VWA
- To present a model applicable to a new substance, the amount of experimental work required to determine the coefficients may not compensate_NRL PO
- Not on its own. Need some evidence for NIAS substances, as industry uses technical standards (chemicals), that are less expensive but also less pure than analytical standards_NRL DK
- Only in addition to practical tests_NRL AU

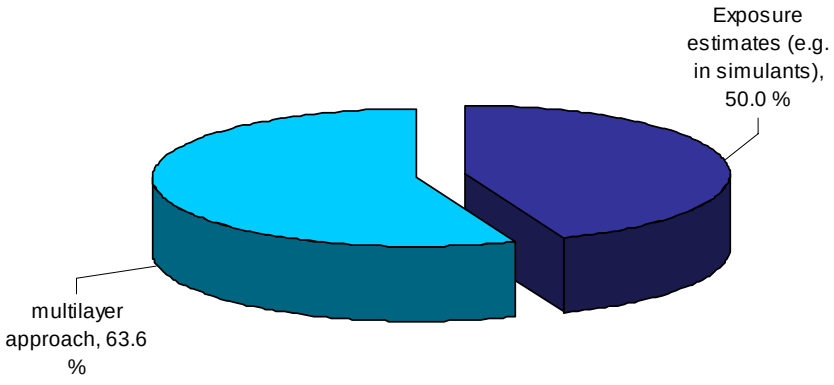
***Do you use modeling to support your own results (e.g. false negatives etc)?***




Comments:

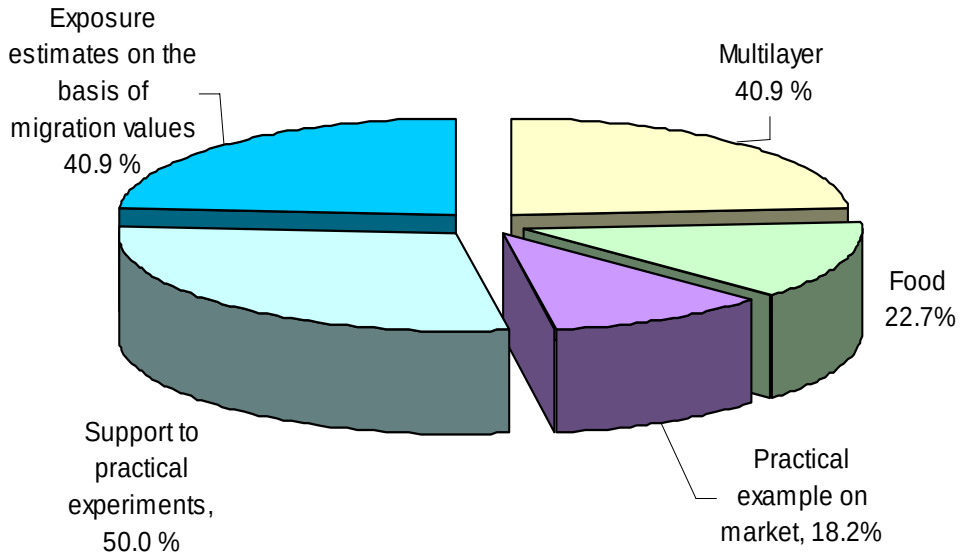
- Would not be used in surveillance work, since this is concerned with actual levels found in the foods_FSA UK
- In research projects yes_NRL UK

***Do you think the future use is towards:***



***If working with modeling***

***Which development do you think would be necessary?***




Comments:

- Our lab would attend the course on modelling in November and then decide on the future use of it to reduce the numbers of practical SML-tests and staff-hours_NRL AU
- No personal experience of working with modelling_FSA UK

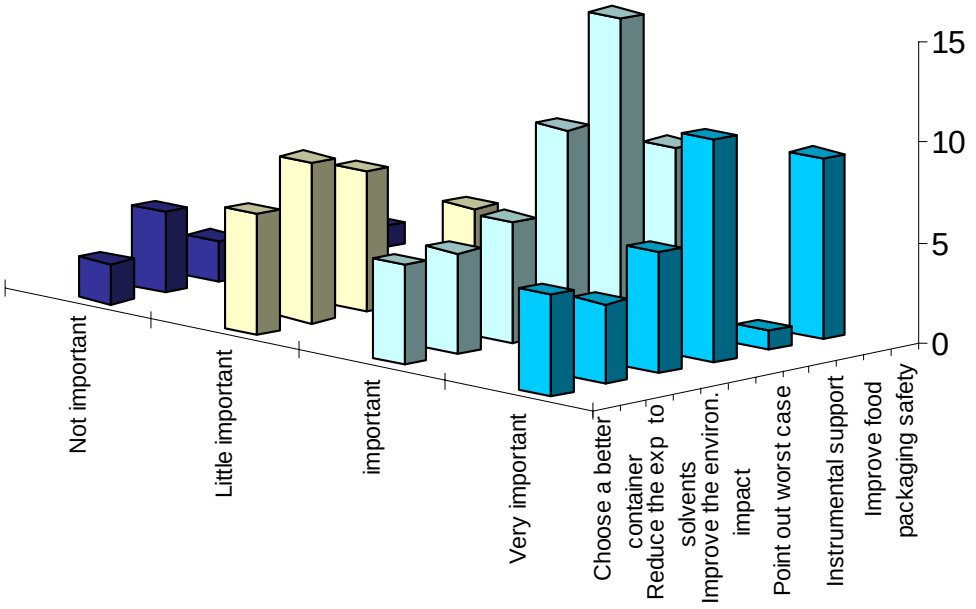
***In your opinion, is modelling a useful tool for the prediction of migration from food contact materials?***

| **The answers were at 90.9 %: YES** |
|---|

Specific comment for this questions were:

- If you are far from the limit_ISEGA
- It is useful to demonstrate compliance, when the predicted migration is far below the SML. In critical cases, lab testing must be carried out_VWA
- Could be but not experience_RIVM
- yes, gives an extra assurance that the experimental results obtained are within the expected range of values_NRL DK
- as an additional tool_INRAN
- We don't have experiences, may be_NRL EE
- yes, specially for the manufacturers of packaging_MSCA CH
- Yes, the modelling can be useful tool for the predicting of migration from food contact materials_NRL PL
- Yes, if a easy to handle software tool is available_NOVELIS
- I think ,YES, despite that I have no experience_NRL CY
- Partly for the whole evaluation of packaging material_VKI AU
- Yes, if validated analytical results verify the modelling at least in an acceptable way_MSCA AU
- Using mathematical modelling for prediction of migration could possibly increase food safety by better selection of food packaging by industry as well as strenghten the efficiancy of food control authorities_MSCA AU
- In general for standard materials, especially monomaterials, I would expect yes !_Ofi AU

***In view of forthcoming extension of possibility of use (Practical Guide) what is your opinion on the use of modeling as it is now (an additional tool) in the following aspects***

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The supporting documents for this chapter (participant list) can be found in Annex 5.

# Annexes

# Annex 1: supporting documents of phase 1 – Literature of interest

Adelswärd V, Sachs L. The meaning of 6.8: numeracy and normality in health information talks. Soc Sci Med 1996 Oct;43(8):1179-87.

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## *Links of interest*

Searchable databases

T-Rex Risk Communication Bibliography - This site contains an annotated bibliography of over 60 risk communication publications. Links to full-text documents are provided when available.

Catalog of U.S. Government Publications - This database allows visitors to search fields for risk communication and risk perception literature. Site contains abstracts.

Combined Health Information Database - This database allows visitors to search fields for risk communication and risk perception literature. Site contains abstracts.

Health Risk Communication Bibliography - This bibliography provides citations to over 800 publications in risk communication and related areas from 1900-2000.

National Environmental Publications Internet Site - This database allows visitors to search US EPA documents stored on-line.

National Service Center for Environmental Publications - This site allows visitors to search for US EPA documents, which can then be ordered in hardcopy.

Publications on the EPA Site - This site offers links to EPA publications that are located on the EPA web site.

PubMed - This site provides a comprehensive database for biomedicine, including access to MEDLINE. Includes abstracts and links to some full-text articles at publishers' web sites.

PubSCIENCE - This database allows visitors to search fields for risk communication and risk perception literature. Site contains abstracts.

Risk Communication Bibliography - This bibliography contains references to articles and books in risk communication primarily from the 1980s.

Toxic Release Inventory: Community Right-to-Know - This site offers information for professionals, officials, and stakeholders on the Toxics Release Inventory, including stakeholder dialogue activities.

TOXLINE - This database allows visitors to search fields for risk communication and risk perception literature.

National Cancer Institute - Risk Communication Bibliography - This site is a searchable database for resources in risk communication.

Environmental Journals on the Internet - This site contains links to environmental articles from scientific as well as popular press journals. There are some full text articles and abstracts available.

National Academies Press - This site allows you to read and order reports from the National Academies' catalogue.

# Annex 2: supporting documents to phase 2 – expert brainstorm

## *Annex 2a- invitation to brainstorm*

Modelling Migration from Plastics into Foodstuffs as a Novel and Cost Efficient Tool for Estimation of Consumer Exposure from Food Contacts Materials.

(QRLT-2001-2390 “FOODMIGROSURE”)

WP7
Consumer Acceptance of Migration Modelling
Invitation to Expert Brainstorm April 2005

European Commission
Joint Research Centre
(Participant nº 05)
C. Simoneau

**European consumer attitude studies approach to diffusion modelling to predict migration from food contact materials:**

Background

The project FOODMIGROSURE aims to provide a novel and economic tool for estimation of consumer exposure to chemicals migrating from food contact plastic materials. The tool should be a physico-chemical migration model that describes mathematically the migration processes from plastics into actual foodstuffs under any actual contact conditions.

The project includes a work package to investigate the social acceptance of migration modelling versus chemical measurements, and its implications for exposure estimation by carrying out a consumer questionnaire and involvement of consumer protection representatives.

Purpose of the invitation to an expert brainstorm

Our Unit (Physical and Chemical Exposure of the Institute for Health and Consumer Protection, European Commission Joint Research Centre) has a larger project on risk perception from chemicals in products for which contact have already been established with a number of experts in the past 6 months.
The Project FOODMIGROSURE is an RTD project already currently running (awarded end of FP5) and that was required to include a consumer acceptance study. Although it cannot yet benefit from the direct input from more recent thorough and broader FP6 projects in the field, it is a unique prototype that requires attention, as packed foodstuffs and packaging functionality are of prime importance for food safety.
As the problem posed is highly focalised and scientific in nature, there is a need for a multidisciplinary brainstorm to tackle concepts for a potential approach.

Invitation:

After review of the most important current projects in the field, we would like extend an invitation to the following experts as a small initial task force. It is not an exhaustive list of course, and it was simply chosen on the basis of expertise and representation in projects that are relevant to the current one;

| Participant | Institute | expertise |
|---|---|---|
| Richard Shepherd | (Univ. Surrey) | Condor; laterlife |
| Ortwinn Renn | (Dialogik) | safefoods, europta; |
| Unni Kjaernes | (SIFO) | trust in food; trust; |
| Lynn Frewer | (U. Wagenigen), | Safefoods; informall; ra-rm; |
| Anna Jung | EUFIC | safefoods |
| De Marchi Bruna | ISIG | trust; foresight |

We are absolutely opened to suggestions at to other professionals with relevant experience. The travel and stay would be reimbursed (information would follow).
We would like to organise this meeting either the last week of May. Proposed dates (1 day) are 23-26 May.
We would appreciate very much to urgently have:
your availability – if not possible availability of a substitute person
your preference for the dates

Below is an introduction to the project, some of the aspects that create difficulties or particularities, the current state of understanding from risk perception and communication perspective (seen from the scientific side) as well as some materials developed in lay terms summarising the messages to communicate.

Preparation for meeting

From JRC part, what has been done
Review of current literature and state of EU projects in the field
Familiarisation with the social science aspects of the problem, including:
terminology of attitude, beliefs, affects, intentions,
current models attitude (e.g. reasoned action), behavioural intention (planned behaviour), attitude change/information processing, and
types of methods for measurements especially qualitative methodologies (which seems to point towards focus groups).
Development and request for review of:
Draft presentation document (annex 1)
Example draft guidance for moderator if focus groups chosen
Example of possibility for questionnaire if also chosen

From the invited experts
Reading of this document and text presented in annexes that are familiarisation tools for the topic and may be the starting point for development of approach.

Discussion points:
Approach
Presentation of topic to an audience: advice on the example prepared

Who is the audience in other projects? Does it cover more levels of familiarity? Does the approach change as a function of the audience? Are the questions also different?.

Premises

Due to the fact that the topic is difficult and requires a certain educational level, the work to be done is quite different than a normal case scenario of market /consumer research.

Although consumer attitude to risks related to food safety or food topics is not new, it is obvious that the past few years have seen a large increase in financed projects in that domain. Food scares in recent years have shaken consumer confidence and a lack of transparency has undermined consumer reassurance. A measure has been to separate the risk assessment from risk management with the creation of the European Food Safety Authority as well as the equivalent agencies at the national level. Many projects currently on-going deal with either acceptance of new products/technologies, trust, food safety, risk communication and risk perception. Even more recently the research has been extended to communication and perception of risk from chemicals in products. All projects have in common the fact that methodologies are often found to be non-transferable from one topic to the next and thus that both models and methodologies have to be redeveloped and defined for each new topic.

The main challenge that was identified along WP7 preliminary discussion in year 1 was the definition of the recipient of the survey, which impacted directly the difficulty of the questionnaire design. In year 1, the consensus had been that because of the complexity of the topic, having the citizen as a recipient would not be so relevant because packaging has never been introduced as a source of risk, and lacked in interest to be forced into a safety issue. Also it was considered that the consumer was most likely the end –user, i.e. the entities that would have to use and or to trust results provided by such techniques in risk decisions. The primary target were defined as enforcement laboratories since they must emit a judgement on the validity of such predictive data in their role in ensuring consumer safety for the Health ministries of their respective Member States, as well as EFSA for risk assessment purposes. Producing industries (directly or via their professional organisations), especially converters on which the burden of compliance is often placed, would be included as well as food industries which must also trust these new methods in their risk management policies. Finally consumer organisations would be represented as final link to the citizen.

However after further discussions with some experts it became clear that the WP of the project FOODMIGROSURE presents a new concept compared to most works in progress in the sense that it implies introducing the concept of risk in an area that has never been associated with risk in any preceding studies. Unlike all other studies, it is not a simple product being presented (e.g actipack, organic food) or technological risk (e.g. food irradiation); It has appeared that the topic can appear confusing even to risk perception experts, therefore the concepts from other studies are not really applicable and need to be revisited and better understood.

Current state of analysis of the project and associated difficulties

Following a thorough review of all current EU project in the field of risk perception, we would like a small brainstorm to have some opinions on approaches and way to present. I understand from various publications as well as the OECD document that this may be a delicate topic. It was attempted to classify the project within OECD categories in the following paragraph.

In the case of the project FOODMIGROSURE, mathematic modelling is allowed in a Directive 200/72/EC for some specific cases for which the method has been validated based on a large compilation of data in a 3 year research project. In terms of stage of risk management, the risk issue stems from a legislative requirement and a previous government policy decision. It is therefore not a risk but an alternative route to risk prevention. The question is therefore whether it controls the risk within acceptable limits in comparison with classical methods. In terms of the type of risk situation, it can be associated with “Risks with high uncertainty” since risks coming specifically from packaging are less known and may lead to consequences that are not fully understood in comparison to other risks.
Therefore it faces three major challenges of complexity, uncertainty, and ambiguity. It is could to be a “Risk with high potential for controversy” triggering controversial or emotional responses, and potentially public outrage. People may feel involuntarily exposed to a risk of contamination from packaging of which they were entirely unaware, and communicating uncertainties of experimental laboratory approach and computerised approach may not reassure them in the least.

The development of approaches for a topic like the acceptance of migration modelling as an alternative to chemical experiment for the verification of compliance with limits set for substances in food contact materials has several specific sources of complexity.
Packaging which is not normally associated as a source of risk;
The exact nature of risk is not known
The topic is unfamiliar
It would be perceived as an imposed risk (rather than voluntary, as the individual has no choice
It would be perceived as under government control rather than individual, therefore uncontrollable

On the positive side, it has no catastrophic potential and may be perceived a fair in risk –benefit distribution, since packaging is first and foremost a source of protection.

For migrosure, the first step is to educate the audience of the presence of a risk and of measures in place, i.e. of risk communication, which can be an entire field to itself as highlighted recently in the European Food Information Council (EUFIC) Quo vadis foof risk communication; EUFIC Forum No 1, August 2004 and requires careful consideration. Indeed food safety rarely addresses packaging. The most common microbiological contamination, mycotoxins, pesticides, antibiotics and growth promoters (hormones), Industrial pollution (dioxins, heavy metals), and bovine spongiform encephalopathy.

Also it has been discussed at length what the audience should be and where to have cut-offs, since the budget of the WP is very limited.

| | EXAMPLES |
|---|---|
| Risk management | SANCO, AGRI TRADE ENTR MS CA |
| Risk Assessment stanpoint | EFSA, BfR, AFSSA, |
| Normalisation | CEN |
| Enforcement | NRLs |
| Contract Labs | PIRA TNO etc |
| Professional industrial associations | CEFIC etc |
| Consumer association | BEUC Eurocoop |
| International authorities | U.S. Food and Drug Administration (FDA)<br>Center for Food Safety and Applied Nutrition (CFSAN) |
| Lay people | consumer |

Annex 1

Example of Draft Brochure text (EN)

Note for reviewers: The text is aimed at lay terms to be used down to the consumer level if necessary; it was developed based on a number of descriptions in various the literature as well as information websites. The presentation must review various important concepts that are aimed at consumer reassurance and related to packaging. In this case, it is quite important that none of the subject be scared instead of reassured by the nature of the topic. Therefore the introduction to the topic is of crucial importance and risk communication on the topic is of primary importance.

Introduction

Food packaging helps to protect perishable products from contamination and extends their shelf life during the distribution process. Various food contact materials and ingredients can be used for food packaging so they have the most efficient. Since food can be quite aggressive, the food can be subjected to heat treatments (e.g. sterilisation) and the shelf lives are longer and longer, it must be also ensured that the components of the food packaging are not extracted by the food in levels that could cause concerns. All substances that enter into the manufacturing are regulated: specific laws establish maximum amounts that are permitted to potentially migrate into foodstuff without causing any health concerns. Those substances such as monomers – the unit that constitute the polymer- and additives mostly are added for specific functionality of the materials (e.g. flexibility, resistance). Therefore tests in laboratory have also been developed to represent real life but worst case conditions of contact between materials and liquids that represents foods. Because the underlying science describing migration is known and can be well described mathematically, in recent years computer simulation have been developed to predict potential migration. These simulations were validated, meaning they were checked with numerous experimental data to see how well the simulations matched experimental results. Scientists believe that the use of such simulations may provide a positive alternative to experimental laboratory tests by reducing the use of solvent and being environmentally friendly as well as reducing the exposure of people to these solvents, being much faster (seconds vs. days) and therefore being much less costly. It would not replace altogether laboratory tests, since scientists believe one always need experimental data to make sure that computer simulation remain trustworthy. We would present to you some background information about food packaging, why it used for foods and how regulations govern their safe use in the food supply, and they are tested to be conform to the laws, and this would be followed a questionnaire to which you would express your opinion with an emphasis on the innovation to predict migration with computer simulation.

What are food contact materials?

The term food contact materials refers to all materials and articles intended to come into contact with foodstuffs, including packaging materials but also cutlery, dishes, processing machines, containers etc. The term also includes materials and articles which are in contact with water intended for human consumption but it does not cover fixed public or private water supply equipment.

Why are foods packaged?

Safe and high-quality food supplies rely on efficient protection from deterioration. Food packaging has an important role to accomplish in this matter, Foods are packaged to protect them and keep them in good condition while they are delivered to supermarkets and stores, stacked on shelves or stored at home.

What functions does packaging perform?

The primary packaging of the food contains it;
Preserves it, and protects it from biological contamination for example by insects or germs,
Protects it from chemical contamination during the processing and distribution chain and shelf life of the product.
Provides mechanical protection to fragile foods like chips
Carries the identification and description of the contents;
Provides visible evidence as to whether the package has been tampered with; and
Reduces household waste by providing only the edible part of foods.

The outer packaging (e.g. paperboard cartons) is an essential means of transporting to retail stores large quantities of the packs for stacking on store shelves.

Why are there so many different types of packaging materials?

Packaging comes in a variety of shapes and materials and include flexible or semi rigid plastics, paper bags & board boxes, can coatings, ceramics, glass, and much more. Many types of materials can be used for food packaging ranging from plastics, regenerated cellulose, paper and board, glass and ceramics, elastomers (natural and synthetic rubbers), metals, wood, textile, waxes etc. Recent years have also seen the appearance and evolution of new materials such as biobased which are produced from renewable sources.
Most food products can be packed in a variety of alternative ways. Manufacturers choose the most appropriate type of packaging for a product, depending on the nature and requirements of the product, the degree and nature of protection needed, the method of distribution, the shelf-life and the environmental impact.

Is packaging wasteful of materials and energy?

It is only when the package is emptied and needs to be disposed of that we notice it. People are seldom aware of the role of the packaging in protecting the product in distribution and until it is opened for use. Of course the production of anything, including packaging materials, uses raw materials and energy. However, both packaging material manufacturers and food manufacturers operate in an intensely competitive environment, causing continual search for ways to minimise packaging costs without compromising the protection or presentation of the product. For example, In 1983 a 1.5 litre PET plastic soft drinks bottle weighed 66 g. In 1990, the weight has been reduced to 42 g; similarly in 1950 a tinplate beer can weighed 91 g. In 1990 an aluminium beer can weighed only 17 g, and was fully recoverable for recycling.
Packaging also reduces the amount of material entering the waste stream. Most packaged fresh and processed foods have had the non-edible material (e.g. husks, peels, vegetable tops, bones of animal or fish, etc) removed during preparation. As a result, those materials are used for animal feed or other purposes instead of going into domestic waste. Likewise, energy is saved by not having to transport that inedible material through the distribution and retail chain to the consumer.
A UK Commission on Environmental Pollution found that total packaging (not just food packaging) contributes 1% of the total of all solid wastes. Total household waste contributes only 4% of all solid wastes. A study of waste by the US Chamber of Commerce indicated that the relationship between food waste and packaging waste was clear; as packaging use (and subsequent disposal as waste) increases, food wastage decreases.

Do we really need the protection that packaging is said to provide?

Yes. Food safety absolutely requires it. Moreover, a World Health Organisation study has indicated that in developed countries with sophisticated storage, packaging and distribution systems wastage of food is estimated at only 2-3%. In developing countries without these systems wastage is estimated at between 30% and 50%.

Do packaging materials affect the food in them?

The packaging material has both to preserve the food and to protect it from deterioration, outside contamination or damage during distribution and storage; and the packaging material in direct contact with a food must not itself harm, or be harmed by, the food. The packaging material for a particular food must therefore be carefully selected with these considerations in mind. Whenever a food is placed in contact with a non-food material there is the potential for migration of some of its ingredients into the food. Considering foods are often subjected to sterilisation and high temperature while already in the package (e.g. cans) and that many packed foods have a long shelf life, both legislation and testing must be

directed towards ensuring safety of the food.

How is consumer safety ensured?

There are three aspects: the law made by the European Union and the ministries, there are the national food agencies that always watch for risk, and there are “enforcement” laboratories acting much like the police and conducting checks on products.

Europe and many other countries have developed strict controls, based on extensive testing, for the use of 'food contact' materials; and these help to ensure that a correct choice is made and that substances can be used as “food contact substances” They must be found safe for their intended use.
To that effect there are not only national laws specific to materials entering in contact with foods, but also harmonised European laws; Packaging manufacturers or a food producer must ensure compliance with the law. These laws can authorise the use of substances, based on extensive toxicological tests as well as chemical tests showing that consider the amount of substance expected to migrate into food without causing any health concerns.

How are food contact materials regulated?

The regulatory system for ensuring food safety and quality in Europe is comprised of EU, state and local, as well as international agencies. The EU system alone consists of numerous laws elaborated by the European Commission together with the competent authorities of Member States and in presence of industrial and consumer associations. There is also a segmentation of some activities to reinforce the control food safety issues such as national and EU food safety authority (EFSA), which oversees risk assessment and allows the use of substances in contact materials applications. There are Laboratories commissioned by the government as National Reference Laboratories that inspect products, and the government in each country can take products away from the market. Collectively, they perform four chief functions:
Establishment of Safety Standards: Through testing, review of scientific research and evaluation of consumer needs, the EFSA approve, reject, limit, or cancel the legal use of chemicals, technologies, or practices; they establish “tolerances,” or safe levels of chemical residues; and set strict regulations for the safe application of a chemical or other food safety technologies.
Legislation setting compliance limits: The recommendations are taken on-board into the development of harmonised legislation by the European Commission; where laws are not harmonised it is the responsibility of the industry to comply with each Member States laws.
Monitoring and Inspection: In each Member State there are laboratories commissioned by their competent authorities to inspect materials and packaged foods. Each country also has a National Reference Laboratory most expert in these types of analysis.
Enforcement: Government officials have the authority to stop international and domestic food shipments, reject individual foods or lots, shut down plants, assess penalties, and prosecute suspected offenders.

How are substances contact materials tested for use for food

There two types of tests: toxicological and chemical
The toxicological tests are mandatory and follow strict protocols;
The chemical tests are called migration tests and involve to place the material containing the substance(s) in contact with liquids that simulates various foods, since it would be impossible to test each type of food. The liquids to corresponding to foods are set by law and represent worst case scenarios. The material and its so called “food simulant” are then placed to a certain temperature for a certain time: these temperatures and times are also set by law and represent worst case conditions. The methods that are used include both the part that forces the substances to migrate (migration or diffusion) and then the extraction and analysis of all substances that can migrate when they are quantified to see whether the authorised levels are not exceeded. These methods can become what are called “European standards”, when they have been tested in different laboratories and when the maximum variations while operating in different laboratories is known and acceptable. The European Committee for Standardisation gives the certification when a method becomes a “European standard”.

Recently the legislation has also allowed to use computer simulations to predict migration and test compliance; the reason is that migration in plastics can be described mathematically; It is what is called a diffusion process. When experimental data also confirm this prediction, then these simulations can be used for further compliance testing instead of always experimenting in the laboratory. Scientists and legislators see benefits in terms of cost savings as laboratory experiments are expensive, time savings as the answer takes seconds instead of days, health benefits by lesser long term exposure of laboratory workers to solvents, and environmental benefits as less solvents are used and need to be recycled or released in the environment.

[should uncertainty be addressed and how?]
uncertainty in lab exists: diffusion, operators, analysis
uncertainty in model exist: depends on quality of lab results

Annex 2

Example of draft Moderator’s Guide for Focus Groups

The topics that would be discussed and their order would be decided in advance so that there is consistency between the locations. This guide was developed from a number of surveys in the area of food safety, irradiation, GMOs and actipack.

Consumer Acceptance Study

In order to stimulate some reaction to packaging at the start of the general discussion the following packs would also be shown:
10-15 mins
Here are some typical packs:
Chilled meat pack – tray with overwrap
Carbonated drink
Juice in TetraPak
Can
Coffee pack with valve
Baby food

What do you want packaging to do? (Typical responses might include the following:)
Protect (from tampering, from biological/climatic hazards ect)
Preserve (guarantee freshness, extend shelf life)
Inform (describe product and how to use it, defined 'best before' or 'use by' etc
Convenience (easy open/resealable, easy dispensing)
Environmentally friendly (recyclable or reusuable, no excess packaging
Minimum cost

10-15 mins
Packaging is in contact, so we want to make sure it does not release anything to the food so we have safety features.
Following steps to raise awareness on packaging

1 General attitudes towards packaging, especially food packaging
Awareness of packaging functions/issues (protection, preservation, information, convenience, environment etc)
Positive/negative aspects? (waste, energy vs protection?)

2 Awareness of Consumer Protection
Awareness of existence of both national and EU legislation for packaging safety
Awareness of ministries into protection also on packaging
Awareness of agencies for protection (EFSA, AFFSSA , BfR)
Awareness of national laboratories to do so (NRLs) to enforce
Awareness of methods to enforce compliance (CEN)

3 Attitude towards methodologies for enforcement testing
Understanding of worst case
Understanding of t/temp exposure
Understanding of use of simpler media than foods
Understanding of dynamic process taking place
Understanding of describable process

4 Attitude towards uncertainty 2
Understanding of uncertainty with experimental methods
Understanding of development of models
Understanding of validation of models and relation with experiments
Understanding of uncertainty with modelling

5 Attitude towards modelling
Understanding of scope of modelling (cost/ time saving, screening, estimation + checking experimental results in some cases; reduction of uncertainty?)
Desire/need/benefit for such system (expensive laboratory work, long method development, >300 substances regulated that need to be monitored)
Reaction to its presence in food packaging legislation
Reaction to its effects (cost, reduction of uncertainty)
Benefits/concerns time, cost, environment
Limits (need validation prior to use)
Consideration of environmental issues – disposability, recyclability, less use of solvents.

How do you feel about these solutions in relation to environmental issues such as disposability and recycling.

[2] Uncertainty: is there a consensus on addressing uncertainty and how to make it in a transparent way to avoid negative perception?

Do you have any further personal comments to add?

Conclude with brief explanation of why we are carrying out the focus groups.

The software (e.g. from FABES) can be shown to illustrate a typical example. With a brief description for the purpose of illustration with practical example.

It would be relied on the natural flow of the discussions to generate comments so some of the output would also come from unsolicited source and participants would have also space for specific conclusions not led to by a questionnaire.

The focus group sessions would last maximum 2 hours with at minimum 15 minutes being spent on their general attitudes to packaging, 45 minutes on protection/ enforcement /methods/uncertainty and the remainder on the attitudes to modelling.

Questionnaire type Version 1.0

How knowledgeable were you about food packaging safety before reading this leaflet/hearing this presentation? (Please check one.)
Not at all knowledgeable
Not knowledgeable
Somehwat knowledgeable
Very knowledgeable

What sections of the leaflet did you particularly found important?
Benefits of packaging
Risks of food packaging
How is safety tested

Before reading the leaflet/hearing the presentation, what was your level of concern about the potential risks of the following?

| | no concern | some concern | serious concern | no opinion |
|---|---|---|---|---|
| Pesticide Residues | | | | |
| Genetically modified organisms | | | | |
| Bacteria (germs) | | | | |
| Food Irradiation | | | | |
| Food Additives | | | | |
| Food Packaging | | | | |
| Mad cow disease | | | | |
| Use of Chlorinated Water | | | | |

After reading the leaflet/hearing the presentation, what was your level of concern about the potential risks of the following?

| | no concern | some concern | serious concern | no opinion |
|---|---|---|---|---|
| Pesticide Residues | | | | |
| Genetically modified organisms | | | | |
| Bacteria (germs) | | | | |
| Food Irradiation | | | | |
| Food Additives | | | | |
| Food Packaging | | | | |
| Mad cow disease | | | | |
| Use of Chlorinated Water | | | | |

How important to you are the following use of migration modelling?

| | not important | somewhat important | very important | no opnion |
|---|---|---|---|---|
| Improve the safety of food packaging | | | | |
| Save the environment from solvent waste | | | | |
| Reduce the exposure of laboratory technicians to solvents | | | | |
| Maintain the safety packaging without chemical experiments | | | | |
| | | | | |

If an authorised computer simulation was used on test safety of packaging, what would be your reaction compared to the using a classical migration test?

Confident --- slightly concerned --- Highly concerned

Are there any areas where you would like additional information?
Types of packaging
Properties of plastics

Safety and toxicity studies on packaging
Regulatory policy
What packaging for what food
bio-packaging
active and intelligent packaging
recyling of packaging

Please, describe yourself for statistical purposes.

Gender: male female

Country of Residence

Expertise in Food & Nutrition
Dietitian or Home Economist
Volunteer Food Safety Educator
Nutrition Scientist
Food Scientist
Polymer scientist
Other:
Lay person

Level of Education
Not high school graduate
High school graduate
Some college
College graduate
Post college graduate work

With what ethnic group do you identify?
Caucasian

Age group
Under 13 --- 13-19 --- 20-29 --- 30-39 --- 40-49 --- 50-59 --- over 60

# *Annex 2b- Results of the expert brainstorm*

EUROPEAN COMMISSION
GENERAL DIRECTORATE JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection – IHCP
Physical and Chemical Exposure

Summary of the 1th Meeting
of the Invited Expert Task Force on Consumer Attitude
for the WP7 of the EU Project FOODMIGROSURE

Ispra, June 23, 2005

Modelling Migration from Plastics into Foodstuffs as a Novel and Cost Efficient Tool for Estimation of Consumer Exposure from Food Contacts Materials.
(QRLT-2001-2390 "FOODMIGROSURE").

Participants (see list at the end in Annex A):

| | |
|---|---|
| AD: Arne Dulrud, | JS : Joachim Scholderer |
| PC : Philip Cnude | UP : Uwe Pfenning |
| CS: Catherine Simoneau | GB: Giorgia Beldi' |

C. Simoneau welcomed the participants and thanked them for coming.
CS Introduced JRC, PCE unit, contact material sector and food packaging and its safety assessment
CS explained the reasons of this brainstorm as support to current EU project: FOODMIGROSURE PROJECT
INTRODUCTION
Kinetic migration on real food ⇒ Modelling
Explanation of Work package 7
Exposition to media and consequent difficulties and risks
CS explained the work done and preliminary Internet research on consumer attitude acceptance behaviour.
Some ideas from previous projects for instance trust in food.
DG at beginning suggested a polling to reach WP7 aim considering the possibility of a subcontract

Brainstorm useful to receive input and suggestions for caring out investigation of consumer attitude toward modelling

Introduction of Packaging material/Protective functions for food safety/contact with food/migration process/consumer safety safety/food packaging (presentation used with European School students) see attached in Annex 2
CS then illustrates specific examples of work carried with EU projects or directly for the European Commission or the European Food Safety Authority
Recycled materials ⇒ limonene, Baby food ⇒ ESBO; Active packaging

AD: "Are gas involved in migration studies? ""No they aren't" said CS " They are not part of the packaging itself"

After a general introduction on packaging material world the discussion is focused on WP7 and the use of computer simulation to predict migration.

Risk communication and related problems.
Introduction of the risk in an area never connected before with risk.
Try to explain in very simple way the situation to the consumer.
Do not create wrong consumer reaction or induce a position

JS: "Which part of risk assessment use modelling?" CS answered, "the software is based on diffusion process that can be described mathematically"

Introduction to modelling and software simulation: MIGRATEST and margarine example.
The model tends to overestimate the migration allowing a higher safety margin.
There are many experimental data to compare with computer simulation for different matrices model migrant and packaging material.

CS shows the informative brochure on food packaging and its safety assessment created by JRC and could maybe also be used in the frame of WP7 (see WP7 Y2 report Annex 1) and shows the literature sources used (e.g. FDA, EUFIC, Trustinfood, Europlast etc)

JS: He had a study on packaging risk perception that he proposed to present in the context of this meeting, which is agreed.

Discussion:
There are many communication problems: e.g. on risk assessment methods but not only.
People do not know what is risk assessment for one thing.
What is the risk? There are different aspects...toxicity, intake and not only migration.
What kind of topic is relevant to consumer?

JS: Several steps should be considered.
"What do you want represent? Risk related packaging or risk assessment or both? "

CS asked whether a general introduction and explanation maybe necessary to make consumer friendlier with the argument before testing their attitude toward modelling?
She explained our CS explains our experience with media and consumer reaction to food packaging argument (Famiglia Cristiana magazine, Newton article, BBC interviews, Sat3 "Nano" programme documentary). The reaction is usually good, but the relationship with media is important, it is important to be careful to say everything and yet to be careful in the choice of word to avoid any useless alarmism.

JS: Presented his data on food packaging risk perception. See in Annex 3. This was an analysis of Consumer risk perception of packaging material or food processes developed within a risk perception questionnaire as a sidetrack in a broader study. The participants were 206 paid volunteers from different educational institutions in AARHUS. Mean age 23 57% female.
The results showed that in a normal situation people do not feel it as a risk.

AD: These results could be different in different country, so we must also be careful.
CS: In our experience within the EU legislative development from the Commission, we see that Denmark is usually considered the most transparent, since it tends to always involves consumer in risk management decisions/developments. There is a lot of consultation so that trust in authority is higher than in some other countries.

JS: Attention with the analysis of data collected with questionnaire; sometimes it happens that a lot of responses fall down in the middle range that indicates that people do not have a personal opinion or do not know exactly what it means.

Discussion:
Often food project involves end user opinion and it is easier when it is food professionals because of they are aware of the topics. It is more difficult when consumer opinion is investigated.

CS explained our practical experience during 2 teaching courses organised by the JRC in 2002 and 2003 to understand migration modelling and use computer simulation. One course was for the National Reference Laboratories (NRLs) and industries (e.g. SMEs) There were a lot of questions and doubts from NRL representatives then followed by a positive reaction at the end of the course, whereas industry representatives came more with a more silent user oriented focus which was tampered by the end of the course.

A possible approach with consumer could be the presentation of real data comparing with computer simulation to make them awareness of modelling possibility.

AD: Is this model approved officially at EU level?
CS explain that the use of migration modelling (and software) is allowed in a European Directive (2002/72/EC) and can be used in a range that includes substances with known and verified experimental data.

FC: Is pharmaceutical packaging involved?
CS answered that it is not a food packaging therefore not included; it is also subject to different legislation, as are also for example medical devices with a different legislative approach.

JS: underlined that is difficult to avoid relation between food safety risk and environment risk the last one always come up.

AD: asked if we are obliged to have a consumer study developed with focus group
CS ask for suggestions and directions from the experts.

AD: there are difficulties related to focus group that have to be considered.

Discussion (general) on focus group option:

If the discussion with a focus group begins with a presentation, it could be dangerous because increase risk consciousness and the results could be biased in that respect.
It is necessary differentiate several steps. First of all it is important increase the familiarity with the topic and increase people interest without underlining immediately the risk aspects.
It could be useful to begin with an explorative phase and then use a focus group.
The selection of focused group is very important and maybe it would be better to choose not only consumer but food

safety experts as well. Do not expect much from the consumer from such a topic.
People are used to think about packaging as functional device to protect food it is important to be careful introducing risk.
It could be useful to compare food packaging related risk with other risks to give it the right size.
It is useful introduce in a questionnaire if any questions not related with food safety to avoid the risk overestimation.

UP: Distinction between individual risk (smoking) and a systemic one (terrorist attack, health). Is packaging a systemic risk or individual one? systemic risk. We need to look at analytical dimension of the risk.

AD: It is a good option to begin the discussion with general question about packaging and its use to obtain a spontaneous evaluation from consumer and to investigate their relation with packaging and their awareness of it. After a preliminary introduction, introduce the risk concept. It is useful give them some examples to link with their daily experience. Some questions could be:
What do you think about packaging? [e.g. milk – or choose an example showing a sample]
Which do you prefer, tetra pack or glass? Why? Why are there so many types of packaging? What do you think about it?
The link them indirectly with a possible risk.

Discussion on selection of a focus group

JS: It is better choose homogeneous group, same educational level, group of ten people, five male and five female that possibly respect demographic scenery.

AD JS FC UP:
Not more long than two hours choosing one or two moderator (less people more time to discuss)
8 person and 1 or 2 people to write down what discussed
Recruitments of people using journal advertisement are not suggested it is better a network in the work place where there are people with different employment. (Three levels: me, people I know and people they friends).
Differentiate between eaters and shoppers, male female etc group must balanced.

Need to have 3 people so 2 can take notes;
In a max of 2hrs for a focus group, the budget of minutes must be well distributed between the different questions (few) and participations from all individuals.
Audio and Video technical support is suggested with focused group.
Select 5 or 6 main questions to reflect on different aspects.

Notion of STIMULI: All that can help people to speak and make associations and take part actively at the discussion (packages materials, pictures).

Could we guide them in such way until risk topic?
It is possible to speak about microwave containers to guide them until possible risk source. Or show them a lasagna tray.

JS: It would be difficult to avoid all some environmental safety connections.

Other possible questions are:
Who do you think takes care of your safety? Or do you feel informed on safety of foods
Who do you think has responsibility of packaging (e.g supermarket, consumer, industry, government)
Do you trust in institutions?

AD: In the middle of this general discussion it is possible introduce computer simulation and test to investigate food packaging safety to avoid to influence their opinion.

The flow of discussion (conceptually) would go: from
Ideas/beliefs => risk/benefits => methodology => protection

One minute to pose and explain the question.
Introduction: package is a bought everyday (daily action); Protection type of question:
Do you think there can be an interaction between the package and the food
If answer is NO => show plastics (e.g. bottle of water with best by date, or can)
DO you think scientists and government look at safety
Do you have any idea o=n how packaging is tested for safety in the lab; is it of importance to you?

When presentation; introduce someone else than the moderator, (e.g. a colleague) for the part on showing the experiment or the demo of modelling.

It is better to organize more focus group just in little country including a newly entered country for example Lithuania or Slovenia further North South and Middle Europe representatives.
BUT: Remember, the more data ⇒ much more time and complexity of analysis!!

Discussion: Usually most used countries are UK, DE or FR, a Nordic one, ES/I and now probably new MS; That is if choice is based on geographical aspects; IN the case of packaging one proposal is to base the choice on the occurrence of packaged food *highest convenience oriented country" to lowest; in this case it would be very natural to retain only 2 countries the UK and a Southern One (Italy or Spain); so the agreement is to have those 2 countries as representative of this initiative.

Discussion on what is the analysis of results

UP: The analysis of results takes much time and it is very complex. Can be easily two or three man-month.
Text and its structure must be analysed using customised software. This software is able to account for how many times a specific word appears in the text (based on specific written transcripts of audio analysis of all discussion of focus group that have been recorded) and what is its connotation positive or negative.
Because of this amount of work it is suggested to reduce the number of the Member States involved in this study and choose the most representative ones considering packaging consumption or use.

AD: What is our final deliverable?
CS: Final report and summary of questionnaire or focus group discussion results

JS: It is difficult to insure that the answers are individual and not result of interaction between focus group participants. Global answers must be avoided. For these purpose it is useful to differentiate as much as possible multiple-choice answers.

Discussion of different source of costs of such studies

Recruitment of participants
How many countries and how many sessions of focus groups
Facilities
Development, moderators and session(s)
Customisation of software and data analysis (greatest source of cost and time)
Gift: e.g. 20/50∈ each or material?

Recruiting:

A recruiting agency can be used: they have sources of names to use a subjects for polling: there is a cost associated to its use.
Work staff can be used to recruit participant with a snowball effect (e.g. three generations = 3 levels as outlined before) ⇒ This is a cheaper solution (SIFO uses it with good results). The attention must be that the final people do not know the interviewers and do not know each other.

Attention at not recruiting kids and teenagers: they are not relevant for these purposes; housewives may be more relevant.

How many countries and how many sessions of focus groups + facilities

It may be not sufficient to have one focus group for each country (choose at least two homogeneous groups for each chosen country).
In Italy (e.g. JRC led): It is better place focus group activity out of JRC to have a more familiar atmosphere for the discussion. (Ex. Clubhouse).
Need to us use harmonised protocols in the different locations (outside scientific facilities as well)

Side discussion based on question from CS whether uncertainty (analytical vs. modelling) should be addressed.

See agreement above: countries based on occurrence of convenience and highly packaged food vs. not: UK and Italy as countries for testing within the WP7

JS: do not introduce uncertainty or standard deviation to avoid scaring people

Suggestions for some typical questions (outcome of discussions)

Matrix of where in our development phase: the focus group is the last step:
Issue- top level
Research questions – middle level (systemic/ individual)
Focus group questions

What do you think packaging does?
Do you think sometimes packaging can have effects on food different from its protection? OR
Do you think packaging could have effects on food? OR
Do you have Doubts or questions concerns packaging? OR
Do you think that long time packaging has effects on the quality of food? (Ex. Water bottles expired data)
OR
Why there is an expiry date? Is it referred to packaging? OR
Show examples: e.g. hot coffe and plastic cup material to introduce gradually risk topic

After the risk is introduced:
Do you know how the safety is controlled?
Do you have any ideas how scientist test packaging for safety?
What kind of information would you have to insure your safety?

JS: legislation is not relevant just methodology computer simulation and laboratory tests. Other forms of questions:
How do you think experts check your safety?
Do you feel sure about this testing procedure?

FC: Another for of questions
Do you think scientist and government check safety?

Use a lot of STIMULI
CS proposal: should we use for example lasagne in microweavable trays in Italy for example?
Discussion: The lasagne example can be useful (fresh, frozen, microwave). In addition microwave is a good accepted technology

Discussion on computer simulation introduction

It is better to show a little presentation to introduce them to test procedure and computer simulation with a real example in a very simple and clear way because they are not competent to understand and judge method modelling. It is useful compare data from computer simulation and experimental ones.

Other types of possible questions:
Why we have to prefer computer simulation instead of experimental test?
Do you think it is enough to assure food-packaging safety?
What more could be done?

It is useful to explain that PC simulation allows to have more systematic data and more checks⇒ more safety.

Other suggestion:
After this little presentation let discussion go on!! What do you think about it? (maybe this is the simplest way)
Do you have any associations?

It is difficult preview focus group.

FC: he suggests doing a preliminary draft on what to discuss in the meeting to plan carefully the research design.

AD, JS, FC, UP: maybe we need support for recruitment of people, data analysis, training to use software and also contact with focus group experts to ask them information.

AD: Suggestions for any group conducted in Italy: Need help with moderating; native speaking is also important.
Dott.ssa Laura Terani works at SIFO but is from Milan (and worked on trustinfood project)
Dott. Donato from Florence (also worked on the trustinfood project)
Other (ISIG?)
Same for England… check for options (Surrey?)

UP: he is working on a focus group next September and invites us to assist to do experience. (Argument of focus group: food risk and risk communication – in German though).

CS thanks everybody to take part in this meeting and ask them to keep in contact by e-mail for new suggestions.

Additional input for next phase

Provided by e-mail from Uwe Pfenning as contribution to the meeting discussion
about how consumers perceptions of possible influence / migration of packages and food products can be experienced.

Form of forum

Focus groups seems to be the adequate method because of the complexity and scientific nature of the topic is very complex. A standardised questionnaire may fail and a qualitative (in social sciences this term means deep individual interview situations or deep interactions between researcher and respondents) approach is most senseful for the research design.

Composition of focus group

A focus group is typically 6-8 (max. 10) participants.

Some stimulus for opening discussion and an interview guideline with the important aspects of the research themes.

Is is a kind of group discussion, the analytical aims are to work out
the perceived dimensions of attitudes towards the topic (packages and food),
all important arguments (stimulated by questions and stimulus presentation),
looking for the exchange of arguments between the participants, especially looking how the respondents handle opposite arguments. Strong arguments are such ones which be accepted by other respondents, weak arguments are such ones which must be modified or being lost in the discussion.

Materiel and equipment

An audiotape of the whole discussion is needed for the analysis, better a video-audio-taped documentation. But as the focus group would take place in different partner-countries the technical equipment of the lowest level is the common base for the analysis (i.e. audio tape)

Procedure:

Choosing and inviting respondents
maybe for a random sample of a telephone sample, or for some consumers at a super market. using flyers and presenting an incentive like 30 - 50 Euro. I suggest to look for a consumer focus group, recruiting respondents from consumers from a super market in Ispra or any other town close to Ispra.

Choosing and preparing
(guidelines, knowledge base also.) the moderator/facilitator

Group discussion
Should take enough time for bringing in any argument of any participants. For example: 8 participants * 6 questions * 5 Minutes per statement = 240 minutes (too long), thus reduced your questions or the time period for one statement. But this time limit must be communicated as a "rule of the discussion for all participants" and (re)strictly being controlled by the moderator/facilitator (i.e. yours?).

(optional) questionnaire
This might take place to make it possible to analyse effects of the discussion you can (no "must") present a short questionnaire with some standardised questions about food risks and their perceptions of the respondents. The analytical aim is to intend if there are any predisposition about the awareness of food risks and packages. For example you can present a table with food risk, including packages and let respondents ranking this risks under their perceived subjective relevance.

Chronology of focus group

Introducing all respondents and introducing the procedure of the discussion
(i.e. free discussion, no wrong - no right positions, every argument is guiltless, rules for discussion, everyone should participate). For analytical reasons it is important to know from whose respondents are which statement. Thus let them say for any statement first their (second) name. It is not necessary if you can use a video tape documentation.

Starting the discussion process
With a common question about food and packages like: Have you ever thought about risks or problems which can be arise by migration of materials from packages into food products?
Let everyone give a statement to the question, afterwards asking if there is a need for a discussion about the position of anyone in the group

Present stimulus 1:
Present your basket with the different packages and let people judge if they assumed that there would be some danger or risks for migration of polluted materials as unintended ingredients of the food product.
Let respondents discuss this topic in two or more rounds with statements of everyone

Present stimulus 2:
The results of an experiment (as you have mentioned for the pupils).
Let respondents discuss this topic in two or more rounds with statements of everyone

The end
Asking respondents if they would miss any topic not yet discussed. Let them summarise their positions towards food risks through migration of packages materials.
Let them notify their socio-demographic characteristics (gender, age, education level, profession) on a short questionnaire

Analysis

Two units or levels:
all arguments are in the pot and are a tool for your analysis (easier)
all statements of one respondent, summarised in a typology of respondents (more complex)

All statements should be put in a transcript (i..e not necessary if you used a digital audio tape documentation via laptop and a OCR software for transforming the input signals into a word document.

Make a dictionary with all important expressions of your guideline (for example food risk, packages, ingredients, consumers role, safety also. Normally a first content analysis is helpful for this first step., just looking to all words which are mentioned in the transcription.

Coding all phases or parenthesis in the transcription (i.e. sentences or chapters) which including the important semantic terms and associate this coding with dimensions of evaluation like bad/good, ambiguity/ambivalence/polarised, uncertainty/safety also. It is most helpful to use therefore a software tool for content analysis (Atlas-TI, WinMAx, Textpack).

Interpretation the results of both levels; arguments and typology of respondents (for example: the "Critical", the Optimist, indicated by looking and summarising the judgement of every participants for every question in the interview guideline.

Proposal

UP: to offer volunteer support of various stage points such as:

Look for the interview guideline with your important questions before starting your focus activities
Provide a special software available for analysing the transcripts, (i.e. "trustful" copy without any restrictions for internal purposes and use).
Send some examples for such a process of analysis and interpretation
Discuss the results of the interpretation

Annex A:
Risk Perception from food contact materials
Thursday 23rd June 2005

LIST OF PARTICIPANTS

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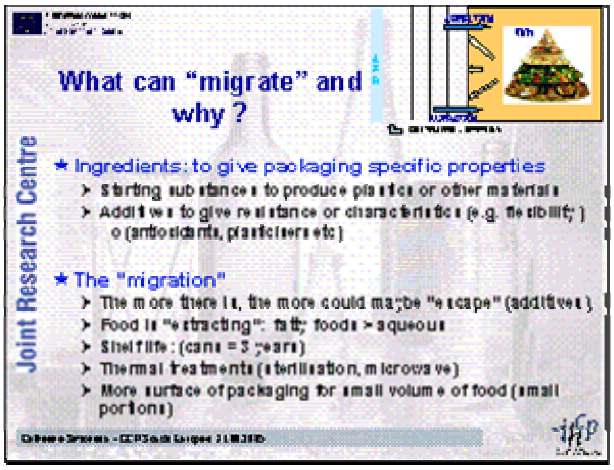
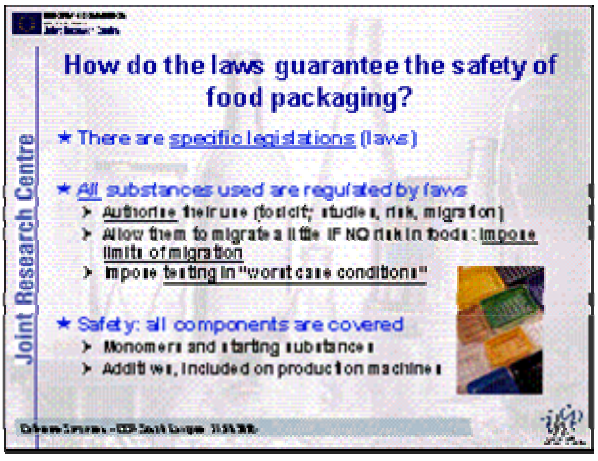
Presentation for social science experts (21.06.2005), Ispra
[part on food packaging]







## And these tests... in practice?

Joint Research Centre

- Testing on every food would be impossible
- There are liquids that can mimic "worst case" foods
- The "worst" material containing the substance is exposed to these "worst" liquids at the "worst" temperature for the "worst" time to see if and how much it releases
- The tests also follows the type of use of the materials (one or two sides in contact)

## On what do we work here?

Joint Research Centre

- Study if and how substances can be released from the packaging into foods
- Study how much these substances can be present in foods and if they are OK compared to the laws
  - We also have to develop methods to identify and quantify the substances that can migrate
  - There are more than 300 ingredients that are regulated
- Our work has been nominated Community Reference Laboratory of the EU Community = reference point for the control and government laboratories

## Example 1: Recycled materials

Joint Research Centre

- PET + paper and board
- Verify safety of use (and abuse) of these materials
- Identification/quantification of potential contaminants in recycled materials

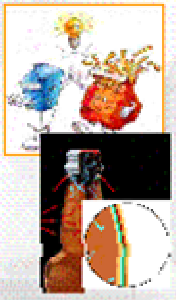
## Example 2: Baby foods

Joint Research Centre

- Epoxidised soybean oil (ESBO)
- Normal : to guarantee vacuum pack and no microbial contamination...
  - Not dangerous... but
  - "plasticiser" in packet up to 36%
- 2 "lists" for us
  - Analysis of >260 samples in all Europe: some samples above limits
  - The risk... everything can be OK
  - Do products upset the limit of the law: maybe not, need to inform countries

## Example 3: "active" ingredients

Joint Research Centre



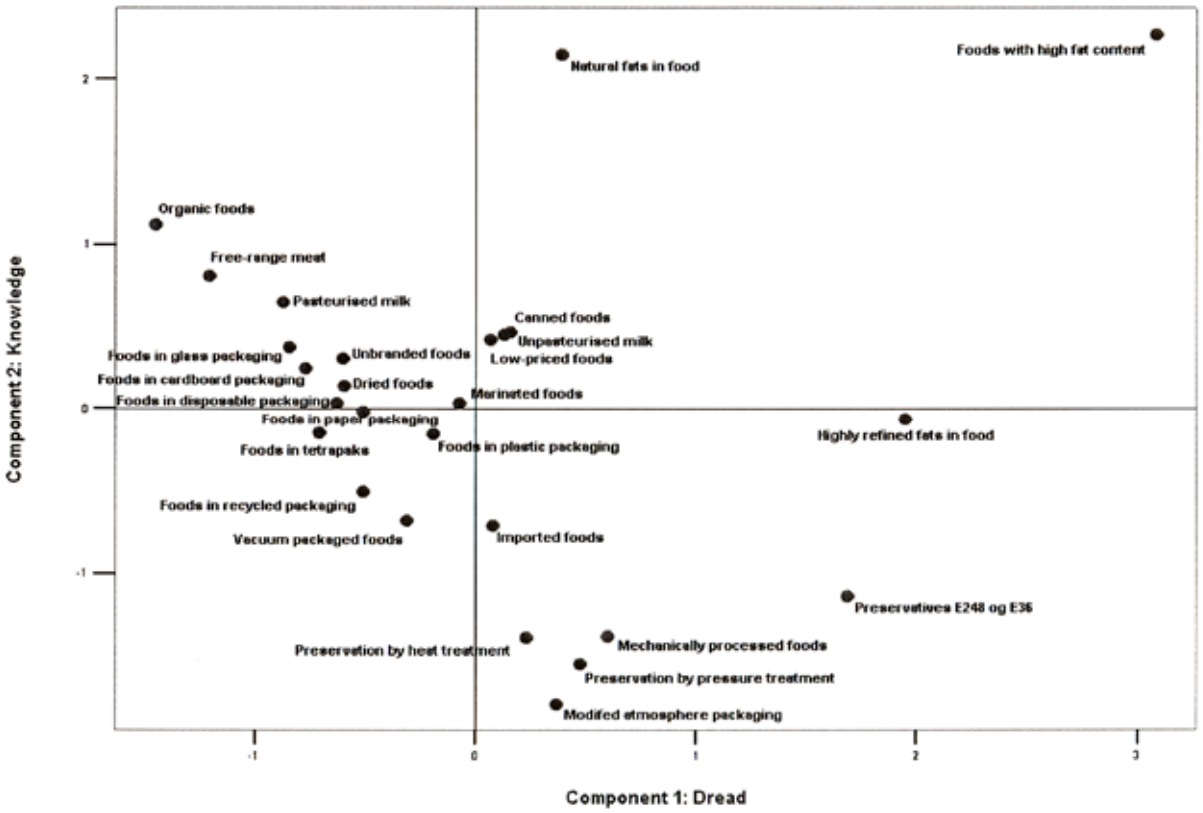
- Intended to extend the "life" of packaged foods
- Materials contain components that can release or absorb substances
- Allowed in Japan, Australia, USA: EU wants to allow them too
- Studies of safety: understand how they function exactly

## Conclusions

Joint Research Centre

- Who we work for?:
  - The EU Commission, the "Member State", The Food Safety Authority," etc.
- For what do we work?
  - To allow to develop new laws
    - On the base of real scientific studies
    - For new application and developments
  - To allow to better estimate any risk
    - The data are also used by the EU Food Safety Authority
  - To make available always better methods to control and inspection laboratories

Annex 3: results of a Questionnaire which included some aspects on food packaging (J. Scholderer, MAPP)



## Annex 3: supporting documents to phase 3 – Focus Group

## *Annex 3 a – letter of presentation*

Ispra, 6 giugno 2006

Gentile Signore/Signora,

Il Centro Comune di Ricerca della Commissione Europea, con sede ad Ispra (Varese), è uno dei partner del progetto FOODMIGROSURE, finanziato dalla Commissione Europea nell'ambito del V Programma Quadro di Ricerca (QRLT-2001-2390). Tale progetto, relativo alla sicurezza alimentare, è coordinato dal Fraunhofer Institut (Freising, Germania) e coinvolge università ed istituti di ricerca in sette paesi: Austria, Belgio, Germania. Gran Bretagna, Italia, Spagna, Svizzera.

Fra i compiti del progetto rientra la realizzazione di un focus group (gruppo di discussione) da tenersi a Udine, in data 20 giugno prossimo. Le modalità organizzative Le verranno spiegate dal Sig. Carlos Corvino.

Nel caso Lei fosse interessato/interessata a partecipare alla discussione, La prego di voler cortesemente rispondere al breve questionario che il Sig. Corvino Le sottoporrà e di lasciargli i Suoi recapiti per essere ricontattato.

Per qualunque ulteriore chiarimento ritenga necessario, potrà rivolgersi a me personalmente o ai consulenti incaricati di condurre la discussione di gruppo, Prof. Luigi Pellizzoni e Dott.ssa Bruna De Marchi. Troverà in calce numeri telefonici e indirizzi di posta elettronica.

La ringrazio per la Sua cortese attenzione e La saluto cordialmente
Catherine Simoneau (Responsabile Tecnico del progetto)

.....

European Commission, DG-Joint Research Centre
Institute for Health and Consumer Protection
Unit Physical and Chemical Exposure
Sector Head - Contact Materials
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## *Annex 3b: Questionnaire for recruiting procedure*

FOODMIGROSURE
Progetto finanziato dalla Commissione Europea nell'ambito del V Programma Quadro di Ricerca (QRLT-2001-2390)

QUESTIONARIO
per la selezione dei partecipanti al focus group

1) Di solito è Lei che si occupa di acquistare i prodotti alimentari per la famiglia?

Sì |__|
No |__|

2) Composizione del nucleo familiare o di convivenza (escluso il rispondente)

| | Numero componenti | |
|---|---|---|
| Età | M | F |
| Fino a 10 anni | | |
| Da 11 a 17 anni | | |
| Da 18 a 35 anni | | |
| Da 36 a 60 anni | | |
| 61 anni e oltre | | |

3) In quale proporzione incidono i cibi già confezionati sul totale degli acquisti alimentari della Sua famiglia (nucleo di convivenza)?

| MIN | | | | MAX |
|---|---|---|---|---|
| | | | | |

4) Secondo Lei, le confezioni dei prodotti servono prevalentemente (una sola risposta):

- a rendere il prodotto attraente |__|
- a rendere il prodotto sicuro (igiene, conservazione, …) |__|

5) Per cortesia, può specificare il suo titolo di studio?

- licenza elementare |__|
- licenza media |__|
- licenza di scuola superiore |__|
- laurea |__|

6) Per cortesia, può specificare la Sua età _____

7) Ha delle preferenze per l'orario di inizio della discussione di martedì 20 giugno (durata di circa due ore e mezza):

ore 17,00 |__|
ore 17,30 |__|
ore 18,00 |__|
indifferente |__|

8) Genere

M |__|
F |__|

Nome e cognome_____

Comune di residenza_____

Recapito telefonico a cui può essere contattato_____

Eventuale preferenze di orario per il contatto telefonico_____

Indirizzo e-mail_____

## *Annex 3c: letter of acceptance for focus group participants*

Ispra, 19 giugno 2006

Egregio Signore/Gentile Signora,

……

La ringraziamo per avere accettato di collaborare ad un gruppo di discussione nell'ambito del progetto FOODMIGROSURE relativo alla sicurezza alimentare finanziato dalla Commissione Europea nell'ambito del V Programma Quadro di Ricerca (QRLT-2001-2390).
Tale progetto è coordinato dal Fraunhofer Institut (Freising, Germania) con partner in 7 paesi: Austria, Belgio, Germania. Gran Bretagna, Italia, Spagna, Svizzera,
Per agevolare il lavoro dei ricercatori, le sessione sarà registrata. Le garantiamo che l'analisi dei contenuti della discussione e i suoi risultati saranno trattati in forma rigorosamente anonima e utilizzati a soli fini di ricerca. Le garantiamo inoltre che il Suo nominativo non comparirà nel rapporto di ricerca, né sarà reso pubblico in alcun modo.
La preghiamo di sottoscrivere la presente lettera per accettazione.
Nel ringraziarla ancora per l'utilissima collaborazione che ci offre partecipando al gruppo di discussione, porgiamo distinti saluti

Catherine Simoneau (Responsabile Tecnico del progetto)
.....
European Commission, DG-Joint Research Centre
Institute for Health and Consumer Protection
Unit Physical and Chemical Exposure
Sector Head - Contact Materials

Firma per accettazione ……
Udine, 20 giugno 2006

## *Annex 3d letter of presentation interviewers*

QUESTIONARIO

Buon giorno. Mi chiamo… Sono incaricato/a di trovare persone disposte a partecipare a una discussione di gruppo (circa 10 partecipanti) sui temi dell'alimentazione.

La discussione rientra nell'ambito di un progetto di ricerca finanziato dalla Commissione Europea, come illustrato in questa lettera (Mostrare lettera di Catherine Simoneau). Come può vedere si tratta di un lavoro scientifico e non di una iniziativa di carattere commerciale.

La discussione avrà luogo a Udine il prossimo martedì 20 giugno nel tardo pomeriggio e durerà circa due ore e mezza. La sede e l'orario preciso le verranno comunicati nel caso il Suo nominativo sia scelto.

Le verrà riconosciuto un gettone di presenza pari a 50 euro in buoni benzina.

Per facilitare il lavoro dei ricercatori, la discussione sarà registrata. L'analisi dei contenuti della discussione e i suoi risultati saranno trattati in forma rigorosamente anonima e utilizzati a soli fini di ricerca. Le garantiamo che il Suo nominativo non comparirà nel rapporto di ricerca, né sarà reso pubblico in alcun modo.

Se è interessato all'iniziativa Le chiediamo di rispondere ad alcune domande e di lasciarci il suo nominativo e un recapito telefonico al quale contattarla.

## *Annex 3e – questionnaire pre-focus group*

FOODMIGROSURE
Progetto finanziato dalla Commissione Europea nell'ambito del V Programma Quadro di Ricerca (QRLT-2001-2390)

QUESTIONARIO
per i partecipanti al focus group
Udine 20 giugno 2006

1) Genere

M |__|
F |__|

2) Titolo di studio
- licenza elementare |__|
- licenza scuola media inferiore |__|
- diploma scuola media superiore |__|
- laurea |__|

3) Età |_____|

4) Composizione del nucleo familiare o di convivenza (escluso il rispondente)

| Tipo di parentela | età |
|---|---|
| | |
| | |
| | |
| | |

5) Di solito, chi si occupa degli acquisti di prodotti alimentari per la famiglia/nucleo di convivenza?
Io da solo/sola |__|
Io e qualche altro familiare/convivente |__|
Qualche altro familiare/convivente |__|

6) In quale proporzione incidono i prodotti già confezionati sul totale degli acquisti alimentari della Sua famiglia/nucleo di convivenza)?

| MIN | | | | MAX |
|---|---|---|---|---|
| | | | | |

7) Secondo Lei, le confezioni dei prodotti servono prevalentemente (una sola risposta):
- a rendere il prodotto attraente |__|
- a rendere il prodotto sicuro (igiene, conservazione, …) |__|

Se desidera ricevere una sintesi della discussione a cui ha partecipato il 20 giugno 2006, per cortesia indichi il suo nome e recapito

Nome e Cognome…….
Via/Piazza e n. civico
CAP e Città

Telefono:
Indirizzo e-mail:

# *Annex 3f- protocol focus group*

FOODMIGROSURE
Modeling Migration from Plastics into Foodstuffs as a Novel and Cost Efficient Tool for Estimation of Consumer Exposure from Food Contact Materials.

EC Contract QRLT-2001-2390

ALLEGATO

PROTOCOLLO PER IL FOCUS GROUP

WP 7 Investigation of consumer attitude towards migration modeling
(Indagine sugli atteggiamenti dei consumatori verso la modellizzazione della migrazione di sostanze fra alimenti e la loro confezione)

Bruna De Marchi
Luigi Pellizzoni
Carlos Corvino

ISTRUZIONI GENERALI

a) La durata consigliabile di un focus group è di due ore-due ore e mezza.

b) Il protocollo costituisce una traccia per i facilitators. I numeri progressivi indicati si riferiscono agli argomenti da affrontare. Le frasi indicate in grassetto non vanno necessariamente proposte nella forma in cui appaiono, ma identificano i temi da sviluppare. Sta ai facilitators scegliere la formulazione adeguata al contesto.

c) I testi in corsivo contengono indicazioni rivolte ai facilitators sotto forma di suggerimenti, memo e note.

PROTOCOLLO

PARTE 1 – INTRODUZIONE (15 MINUTI)

1.1. Introduzione da parte dei facilitators
Distribuire le lettere di assenso.
Introdurre il tema della ricerca (europea, finanziata dalla CE). Spiegare il ruolo dei facilitators e degli osservatori.
Spiegare quale sarà l'impiego del materiale di registrazione: i nastri verranno usati solo dai ricercatori e l'identità dei partecipanti non sarà rivelata.
Il gruppo discuterà di alimenti e delle modalità seguite per confezionarli e conservarli.
Spiegare che i partecipanti sono liberi di esprimere la loro opinione e che non ci sono risposte giuste o sbagliate.

1.2. Per favore ciascuno di voi si presenti e ci racconti brevemente come è composto il nucleo familiare (di convivenza). Oltre che dell'acquisto, vi occupate anche della preparazione dei cibi?

PARTE 2 – CONFEZIONE DEGLI ALIMENTI: MODALITA' E FUNZIONI (30 MINUTI)

2.1. Quando scegliete quale cibo acquistare, cosa è più importante per voi?
NOTA: se il tema della sicurezza non emerge spontaneamente, sollevarlo

2.2. Quando pensate alla sicurezza dei cibi, quali sono i rischi che vi preoccupano?
NOTA: se il tema della confezione non emerge spontaneamente, sollevarlo

2.3. Pensando alle varie categorie di alimenti, quali tipi di confezioni e di materiali vi vengono in mente?

2.4. A vostro parere quali sono le funzioni e gli eventuali inconvenienti di confezioni e imballaggi?

2.5. Quando acquistate un prodotto alimentare fate attenzione al materiale con cui è confezionato?
NOTA: esplorare che importanza danno al materiale della confezione e per quale ragione.

2.6. Quali caratteristiche della confezione incidono sulle vostre scelte? Ci sono materiali per la confezione degli alimenti che assolutamente non gradite?
NOTA: esplorare se le eventuali preferenze sono collegate a specifici alimenti e perché.
Esplorare anche a quali aspetti della confezione danno maggiore importanza: colore, forma, praticità, efficacia/efficienza nella protezione o conservazione dell'alimento…

2.7. Quali sono secondo voi i pro e i contro dei materiali plastici per le confezione degli alimenti?
NOTA: anticipazione della problematica di cui alla sezione 5

PARTE 3 – MATERIALI DI CONFEZIONE E RISCHI (30 MINUTI)

3.1. Concentriamoci adesso sulle confezioni che entrano in diretto contatto con gli alimenti. Secondo voi, è possibile che esse siano fonte di rischio? Vi vengono in mente degli esempi?
NOTA: esplorare se e fino a che punto ritengono sicure le confezioni. Se fanno esempi esplorare come li interpretano.

3.2. Secondo voi, perché o in quali circostanze tali rischi si possono manifestare?

3.3. Secondo voi, eventuali rischi, da che cosa sono generati?

3.4. Per quanto attiene alla confezione degli alimenti, esistono naturalmente norme e organismi di controllo, a livello sia nazionale sia europeo, sia internazionale. In base alla vostra esperienza quotidiana, ritenete che la salute e la sicurezza del consumatore siano sufficientemente tutelate?
NOTA: esplorare il livello di fiducia e l'attribuzione di conoscenza, competenza e onestà all'apparato regolativo e di controllo.

3.5. Avete qualche idea su come norme e standard vengano fissati?
NOTA: esplorare se è presente l'idea dei test di laboratorio e di 'worst case scenario'. Altrimenti menzionarli.
MEMO: i test tossicologici sono obbligatori sulla base di stretti protocolli; i test chimici, anch'essi obbligatori (migration test) consistono nel porre il materiale della confezione a contatto con liquidi (detti simulanti) che simulano vari cibi (dato che si ritiene impossibile testare ogni tipo di cibo), facendoli interagire in condizioni estreme (temperatura, tempo ecc.). Anche in laboratorio si tratta quindi, in una certa misura, di simulazioni delle condizioni reali più estreme di interazione tra cibi e confezioni.

PARTE 4. SPIEGAZIONE TECNICA DELLO SVOLGIMENTO DEI TEST DI LABORATORIO (15 MINUTI)

Intervento ricercatrici CCR (Centro Comune di Ricerca)
Esempi di materiale di laboratorio utilizzato (celle, esempi di confezioni ecc.)
Filmato di 4 minuti

PARTE 5. LA SIMULAZIONE PER LA VALUTAZIONE DEI RISCHI (30 MINUTI)

5.1. Introdurre l'idea di simulazione
MEMO. Spiegare l'idea di simulazione e fornire esempi: simulatori di volo, simulazione di incidenti automobilistici.

5.2. La legislazione europea ha recentemente autorizzato l'uso di simulazioni al computer che impieghino modelli validati per predire la migrazione di eventuali sostanze dalle confezioni di materiale plastico all'alimento.
La cosa avviene nel modo seguente:

Intervento ricercatrici CCR
Breve dimostrazione di come funziona il software

5.3. A vostro parere, quali possono essere i vantaggi o gli svantaggi dell'effettuazione di simulazioni sui materiali plastici in supporto ai test chimici tradizionali?
NOTA 1: eventualmente ricordare che aspetti di simulazione sono presenti anche nei test di laboratorio tradizionali e anche in altri settori.
NOTA 2 :importante ricordare che sia i test di laboratorio "tradizionali" sia le simulazione al computre, forniscono una sovrastimadel rischio in quanto analizzano il caso peggiore.

5.4. A quali condizioni ritenete che le simulazioni sui materiali plastici siano accettabili?

PARTE 6. FEEDBACK E CHIUSURA (15 MINUTI)
Ricapitolazione e verifica dei principali punti emersi.
Ringraziamento a partecipanti e esperti. Disponibilità a rispondere a qualunque ulteriore domanda circa il progetto di ricerca e a informazioni sui suoi risultati definitivi.

Annex 1g: final report for participants of focus group

FOODMIGROSURE

Modelling Migration from Plastics into Foodstuffs as a Novel and Cost Efficient Tool for Estimation of Consumer Exposure from Food Contact Materials
EC Contract QRLT-2001-2390

OBIETTIVO DEL PROGETTO
E SINTESI DELLA DISCUSSIONE DEL FOCUS GROUP

WP 7 - Investigation of consumer attitude towards migration modeling
(Indagine sugli atteggiamenti dei consumatori verso la modellizzazione della migrazione di sostanze fra alimenti e la loro confezione)

Bruna De Marchi
Luigi Pellizzoni
Carlos Corvino

# *Annex 3g: Summary (IT) of the focus group*

Il progetto FOODMIGROSURE è stato finanziato dalla Commissione Europea nell'ambito del sesto programma quadro di ricerca. Ha durata triennale (2003-2006) e vi partecipano nove partner in sette paesi europei (Austria, Belgio, Germania, Italia, Spagna, Svizzera, Gran Bretagna).

L'obiettivo generale del progetto è di produrre un nuovo strumento per la stima dell'esposizione del consumatore alla possibile migrazione di sostanze chimiche da materiali plastici usati nelle confezioni di prodotti alimentari. Tale strumento consiste in un modello fisico-chimico di migrazione che descrive matematicamente i processi di migrazione dai materiali plastici agli alimenti, in ogni immaginabile condizione di contatto.

Il progetto consiste di diversi workpackage (pacchetti di lavoro) di cui uno riguarda l'esplorazione degli atteggiamenti dei consumatori nei confronti della modellizzazione computerizzata, compreso il confronto con i test chimici effettuati in laboratorio.

Tale pacchetto ha compreso un'indagine con questionario su un gruppo di consumatori e l'effettuazione di un focus group, ossia una discussione mirata sul tema, condotta sulla base di un protocollo precedentemente elaborato, contenente domande, stimoli, temi da affrontare da parte dei partecipanti al gruppo, in un dialogo fra loro e con gli esperti presenti.

Poiché appartengono alla famiglia delle tecniche qualitative di rilevazione i focus group non mirano a ottenere rappresentatività statistica dei risultati. Inoltre essi non intendono identificare opinioni, atteggiamenti o comportamenti individuali, bensì fornire un contesto per l'osservazione delle interazioni tra individui e lo sviluppo di un processo di comunicazione in cui le dinamiche possono essere di cooperazione o di conflitto. Possono pertanto emergere visioni e opinioni condivise come pure contrastanti o addirittura inconciliabili. Il numero tipico di partecipanti a un focus group è compreso tra sei e dieci persone.

Il focus group condotto nell'ambito del progetto FOODMIGROSURE sì è svolto a Udine nella serata di martedì 20 giugno 2006. I partecipanti sono stati reclutati mediante interviste e contatti informali in modo da ottenere un'uguale distribuzione per genere e una differenziazione secondo l'età. Il gruppo è così risultato composto di quattro donne e quattro uomini di età compresa tra i 29 e i 75 anni. Quanto al livello di istruzione, si sono volutamente inclusi partecipanti con livello di istruzione elevato, diploma di scuola superiore o laurea, data la complessità del tema da affrontare e la natura "sperimentale" dell'esercizio.

Il team di ricerca era formato da due facilitators, un osservatore e due ricercatrici del centro Comune di Ricerca (CCR) della Commissione Europea (sito di Ispra), ciascuno con un ruolo precedentemente definito. La discussione è stata condotta secondo un protocollo appositamente preparato (allegato alla presente sintesi) e ai partecipanti sono stati inoltre mostrati strumenti e materiali di laboratorio, nonché un video e una simulazione al computer.

La discussione, durata circa due ore e un quarto, è stata caratterizzata da vivo interesse e coinvolgimento di tutti i partecipanti che sono apparsi reattivi agli stimoli, hanno posto domande, sollevato questioni e interagito sia con i membri del team di ricerca sia tra loro, in modo vivace e allo stesso tempo ordinato. I facilitators non hanno avuto difficoltà a mantenere la discussione focalizzata sui temi proposti.

Gli interventi sono stati generalmente appropriati e i commenti spesso sofisticati, rivelando un'ottima capacità di afferrare i vari aspetti connessi alla tematica della confezione degli alimenti (food packaging), nei suoi vari passaggi, dalla ricerca alla regolamentazione sino ai controlli. Alcuni partecipanti hanno toccato, di sfuggita, argomenti piuttosto complessi come le finalità e le limitazioni della ricerca scientifica, nonché l'etica e la deontologia dei ricercatori.
È probabile che il livello medio-alto di istruzione dei partecipanti abbia contribuito alla loro capacità di elaborare le informazioni fornite e comprendere lo spirito dell'iniziativa di ricerca.

Le principali acquisizioni emerse dal focus group possono essere sintetizzate nei seguenti punti:

Per ciò che riguarda la scelta dei cibi, la qualità emerge come un criterio-chiave condiviso dal gruppo, ancorché condizionato da vincoli di tempo e bilancio. Il concetto di qualità espresso dai partecipanti comprende un insieme di significati: freschezza, gusto, naturalezza, piacere, igiene e sicurezza.

Il prezzo contenuto è generalmente considerato un indicatore di bassa qualità (e potenzialmente di scarsa sicurezza).

La questione dei controlli di qualità è considerata di grande rilevanza ed emerge in diverse argomentazioni avanzate dai partecipanti al focus group. C'è una consapevolezza diffusa dell'esistenza di regolamentazioni e schemi e procedure di controllo a livello sia nazionale sia europeo e una fiducia di base nella loro applicazione, pur con la preoccupazione di possibili violazioni.

Nel corso della discussione, nessun partecipante ha fatto esplicito riferimento alle crisi nel settore alimentare avvenute in anni recenti e che sono state largamente pubblicizzate dai mezzi di comunicazione di massa, come la BSE (encefalopatia spongiforme bovina - meglio conosciuta come morbo della mucca pazza - i polli alla diossina, il vino al metanolo, ecc.).

L'attuale grande disponibilità di informazioni è apprezzata, nonostante le difficoltà che si riscontrano nel discernere quelle corrette ed effettivamente utili da quelle manipolate o superflue. I partecipanti affermano di prestare attenzione alle etichette sulla composizione dei prodotti e alle date di scadenza degli stessi, e sono consapevoli che gli aspetti estetici condizionano la scelta, e possono favorire, o al contrario limitare, scelte di qualità.

Il tema della confezione dei prodotti alimentari è stato sollevato spontaneamente da un partecipante come motivo di preoccupazione, prima ancora di essere introdotto dai facilitators.

L'idea della confezione dei prodotti alimentari è messa in diretta relazione con quella di una loro permanenza prolungata sugli scaffali dei supermercati o nei magazzini di produttori e distributori. E inoltre con processi di lavorazione elaborati.

I soggetti attribuiscono all'espressione "confezione degli alimenti" diverse sfumature di significato, riconducibili alle seguenti categorie:
I materiali di cui sono fatte le confezioni;
Il contatto dell'alimento con la sua confezione;
Specifiche categorie di alimenti identificati in base alla tecnica di conservazione (surgelati, pre-cotti, sottovuoto, ecc.).

Non sono stati menzionati spontaneamente eventuali rischi derivanti da contaminazioni esterne, come agenti chimici o biologici.

Per ciò che riguarda in particolare il secondo punto, le interazioni tra il cibo e la sua confezione, sono due i principali problemi individuati: la migrazione di sostanze e il deperimento dell'alimento. Mentre il primo problema è attribuito ad una confezione inappropriata da parte di produttori, il secondo è ascritto alla non conformità alle norme e al trattamento inappropriato degli alimenti confezionati (ad es. esposizione prolungata al calore dell'acqua in bottiglie di plastica), vuoi da parte dei distributori, vuoi degli stessi consumatori.

I partecipanti ipotizzano che le industrie siano interessate pi ai propri profitti che alla salute dei consumatori e di conseguenza sono preoccupati che la conformità alle regolamentazioni possa essere scarsa, se non del tutto assente.

Il cattivo sapore degli alimenti è considerato un indicatore di scarsa qualità, tanto del prodotto quanto della confezione.

Nel complesso i partecipanti riconoscono i benefici della confezione degli alimenti in termini di igiene e sicurezza, considerando anche i continui miglioramenti delle relative tecnologie.

Non emergono obiezioni di principio ad alcuno specifico tipo di processo o di materiale, compresa la plastica.

Alcune combinazioni confezione-alimento sono particolarmente sgradite, sulla base di una serie di argomentazioni tra loro collegate, che vanno dalla sicurezza all'impatto visivo, dal gusto alle limitazioni della possibilità di scegliere la quantità di prodotto da acquistare. Nel complesso i criteri di giudizio si riferiscono ad una generale idea di adeguatezza della combinazione alimento-confezione.

I partecipanti si sono dimostrati soddisfatti delle dimostrazioni e spiegazioni relative ai test di laboratorio offerte dagli esperti del CCR. La loro soddisfazione si fonda su un'immagine della chimica come una disciplina con una lunga tradizione, dotata di solide basi teoriche e che utilizza procedure consolidate in grado di fornire dati affidabili.

In particolare, tutti i partecipanti sono stati concordi nel manifestare apprezzamento per il lavoro documentato dagli esperti e per la loro propensione a dialogare in modo chiaro e aperto con il pubblico.

La principale preoccupazione manifestata dai partecipanti concerne l'eventualità che i risultati di laboratorio non siano presi nella giusta considerazione da produttori e distributori (in particolare si fa riferimento alla grande industria e la grande distribuzione). La maggior parte delle domande e delle questioni sollevate hanno riguardato non tanto i test e le simulazioni stesse, quanto i loro risvolti applicativi, ossia le misure effettivamente adottate, sulla base dei risultati di test e simulazioni, per prevenire i rischi per i consumatori.

I partecipanti sembrano aver intuito l'idea generale sottesa alla simulazione al computer, come è risultato dalle loro domande molto calzanti. Si sono inoltre detti soddisfatti dell'illustrazione fornita e disponibili ad accettarne le conclusioni di tale tecnica di analisi applicata al problema della sicurezza alimentare.

Non sono state sollevate obiezioni di principio alle tecniche di simulazione computerizzata, anche se alcuni partecipanti hanno sottolineato che è importante ricordare (anche da parte degli esperti) che le simulazioni sono un'approssimazione alla realtà e non una sua esatta riproduzione.

Inoltre, è stato ricordato che l'utilità ed efficacia delle simulazioni computerizzate dipende dalla qualità dei dati in entrata.

Alcuni partecipanti hanno colto nell'uso delle simulazioni computerizzate un aspetto collaterale positivo, consistente nella diminuita necessità di condurre esperimenti su animali, ma tale atteggiamento non è apparso largamente condiviso.

Nonostante non ci siano difficoltà a comprendere la logica del "caso peggiore" adottata sia nei test di laboratorio sia nella modellizzazione computerizzata, permane una certa difficoltà a intuire la differenza tra il rischio scientificamente valutato e la conformità alle soglie di tolleranza legalmente stabilite rispetto ad una certa sostanza. In altre parole, risulta difficile capire perchè, anche se tali soglie sono superate (e un prodotto è ritirato dal mercato per non conformità), non ne deriva necessariamente un rischio immediato per il consumatore, proprio perchè, nello stabilire le soglie di rischio, si sono adottati criteri fortemente precauzionali, considerando scenari che contemplano il peggior caso possibile (worst case scenario).

Alcune osservazioni alquanto sofisticate sono state avanzate circa la ricerca in generale, il suo ruolo chiave nella società contemporanea e la responsabilità, professionale ed etica dei ricercatori, dai quali ci si attende un atteggiamento di umiltà e prudenza, fondato sulla consapevolezza dell'esistenza di un'incertezza scientifica non sempre eliminabile.

Le seguenti osservazioni conclusive possono essere desunte dal focus group:

a) I criteri di scelta degli alimenti e gli investimenti in fiducia nella scienza, intesa come istituzione sociale, sono conformi ai risultati ottenuti in precedenti ricerche, in particolare i progetti TRUST e PABE3.

b) Le espressioni di preoccupazione per la salute e la sicurezza sono accompagnate da altre indicanti i vantaggi delle attuali tecnologie di produzione e confezione degli alimenti. Ciò si traduce in una valutazione attenta, basata su diversi elementi e considerazioni e complessivamente equilibrata, in cui il buonsenso si combina alle nozioni acquisite durante la discussione o precedentemente.

c) I partecipanti concepiscono la ricerca non come un'impressa isolata, bensì come produttrice di applicazioni e indicazioni utili di pubblico interesse. Nello specifico, le simulazioni computerizzate e i test di laboratorio non sono visti in contrapposizione e il giudizio su entrambi dipende dai risvolti pratici, ossia dalla loro capacità di generare solidi e robusti risultati applicabili alle pratiche quotidiane.

Per maggiori informazioni sul progetto, si veda il sito Internet.
www.FOODMIGROSURE.com

[3] Entrambi i progetti sono stati finanziati dalla Commissione Europea, rispettivamente nell'ambito del IV e del V Programma Quadro di Ricerca. PABE è la sigla del progetto "Public Perception of Agricultural Biotechnologies in Europe (1998-2000) <http://www.lancs.ac.uk/depts/ieppp/pabe>. TRUST è la sigla del progetto "Food Risk Communication and Consumers' Trust in the Food Supply Chain" (2003-2005) <http://www.trust.unifi.it>

## Annex 4: supporting documents to phase 4 – Open-day citizen polling (questionnaires)

## *Annex 4a: consumer association- communication press*


COMUNICATO PER ASSOCIAZIONE CONSUMATORI

Le confezioni possono avvelenare il cibo?

La sicurezza degli alimenti è di fondamentale importanza per la nostra salute.
I cibi sono confezionati in modo da essere protetti ed evitare ogni contaminazione esterna. Le confezioni, quindi, non devono rilasciare sostanze potenzialmente tossiche agli alimenti contenuti, rischiando così di alterarne gusto e aroma o, nel peggiore dei casi, di mettere a rischio la nostra stessa salute.
Nei laboratori del Centro Comune di Ricerca Europeo di Ispra cerchiamo di capire cosa accade agli alimenti che rimangono per lunghi periodi a contatto con le loro confezioni.
Le etichette danno molte informazioni sulla composizione dei cibi, sull'apporto calorico e sulle proprieta' nutritive, ma nulla dicono sulla sicurezza dei contenitori. Noi studiamo ciò che le etichette non prendono in considerazione. Per ora.
Una giornata a porte aperte per curiosare all'interno dei laboratori, incontrare gli esperti e per avvicinarsi all'affascinante e misterioso mondo della ricerca sarà un'ottima occasione per diventare più consapevoli nella spesa di tutti i giorni.
Vi aspettiamo tutti sabato 13 maggio 2006 al Centro Comune di Ricerca di Ispra, per una giornata all'insegna della scoperta.

## *Annex 4b-Participants meeting consumer assocations April /2006*

ADOC:
Biasi Sergio
Colombo Gianluca
Cuccovillo Ettore Pantaleo
Dal Magro Franca
Gasparotti Achille
Zitti Pozzi Laura

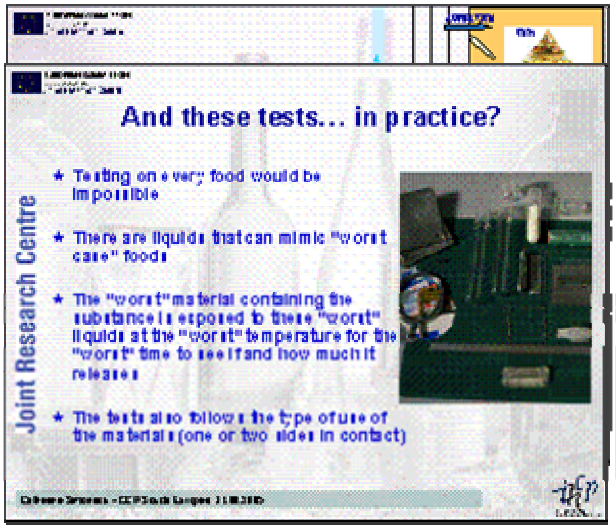
ADUSBEF:
Bosi Barbara
Cordova Francesca
Saladini Laura
Savoldi Samuel
Spataro Fabiana

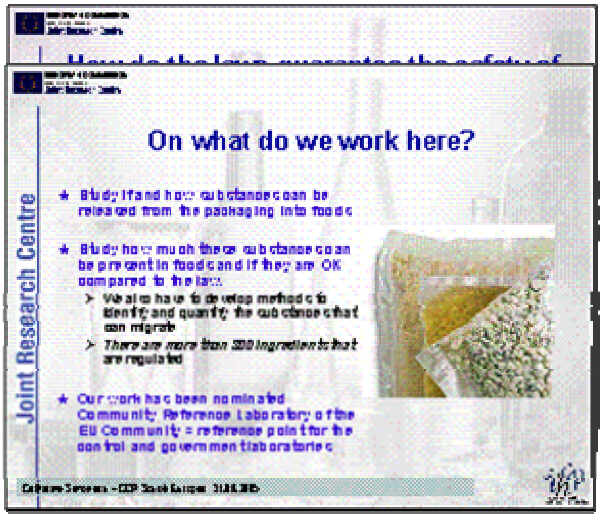
FEDERCONSUMATORI:
Cassinelli Sergio
Castellotti Francesco
Codevico Camilla
Costelli Marisa Franca
De Lorenzo Francesco
De Rosa  Giuseppa
Errico Giuseppe
Gambini Fabrizio
Giannini Arianna
Mastria Alessandro
Merli Elena
Merlo Mara
Mosetti Sandro
Palmieri Luisa
Parrella Antonio
Sissa Alberto
Vignati Domenico
Zilioli Francesco

## *Annex 4c - Presentation for consumer's Associations*









## *Annex 4d - associations; questions and answers session*

After the presentation, there was an open discussion, where questions are reported below as an indicator of consumers' perceptions

- Are there any sort of collaborations with the Food and Drug Administration (FDA, USA)?
- Which are the main differences between the two institutions when approaching to problems?
- Clarifications were requested concerning an alert broadcasted months ago (December 2005) on the main media about aluminium packages, in particular about the glycerol tricaprilate, a synthetic oil used during production processes as lubricant.
- Which is our relationship with industries? Do we have any sort of "pressure" from producers?
- Are laboratory tests on food contact materials performed under the worst drastic conditions? Is it possible to write on package labels all these conditions?
- Concerning active packaging, does the JRC test those coming from other countries (e.g. USA, Japan)?
- Does the JRC help industries to develop new active packaging?
- Are any researches on "intelligent packaging" performed at the JRC in addition to those on active packaging?
- Are all PET bottles on the market recycled? Are researches performed only on recycled PET bottles or also on virgin ones? In case, are the virgin PET bottles safe?
- Does the JRC perform any research on glass bottles? In fact, glass bottles may be made of recycled glass and may contain fatty food such as oil.
- Why researches on glass packaging have never been considered so far?
- Does the JRC have any measure of consumers' phobias about food contact materials?
- What does it happen normally to food imported in the EU from third countries (e.g. China) where, in some cases, normatives on food packaging production are less restrictive?
- Which is the safest food packaging material?
- Which are the most important parameters that consumers must consider for their safety when choosing a packed food?
- Which are the highest risks for consumers concerning food packaging? What consumers have to be concerned about?
- Are there any controls on plastic materials put inside food (e.g. gifts inside Easter chocolate eggs)?
- Who decides priorities and issues on which JRC researches must focus?

## *Annex 4d- Citizen's comments during open-day*

(written comments at the end of the questionnaire)

CRL FOOD CONTACT MATERIALS - CONSUMER SURVEY OPEN DAY

Statistics:
700 questionnaires filled; as one was given per family on average, it is estimated that the number of visitors was close to 1400; The maximum capacity was 40 people per 12 min. Per 7.5 hours (hours 10:00-17:30), i.e. 450 min. , thus about 30-37 tours, equivalent to a total of a maximum of 1500 people.
Out of the 700 questionnaires, 30% contained a comment even though it was optional to do so. All the comments were collected and reported below.

Comments:
Voi ricercatori dovreste essere piu visibili - *Researchers should be more visible*
È stato molto interessante - *It was very interesting*
Buon Lavoro - Proseguite così; Grazie - *Good work, keep doing what you do; thank you*
E auspicabile che dopo ogni allarme, i risultati delle ricerche (siano essi favorevoli o sfavorevoli) vengano resi noti al pubblico in maniera imparziale e veritiera: Grazie a Voi e buon lavoro! - *It would be nice that after each alarm, the results of your studies (either positive or negative) should be shown at the public. Thank you and good work!*
La visita mi ha fornito un' importante conoscenza degli alimenti; Grazie - *The visit gave me an important awareness about foods; thank you*
La visita è stata molto interessante; soprattutto il video; Grazie - *The visit was very interesting, above all the video, Thank you*
Potenziare la ricerca – *give more power to such research*
Bravi; continuate a studiare per la nostra sicurezza alimentare - *Good; keep investigatng to guarantee our food safety*
Bravissimi; complimenti per impegno ed entusiasmo - *Very Good; compliments for your commitment and enthusiasm*
Ottimo lavoro per l'informazione dei consumatori e per aver saputo comunicare in modo semplice e chiaro la ricerca scientifica - *Very good job for consumer information and for easily and clearly communicate scientific research*
Ottimo filmato e grazie della squisita disponibilità dismostrata durante la visita ai laboratori - *Very good video and thank you for the exquisite availability showed during the laboratory visit*
È importante coninvolgere il consumatore - *It is important to involve the consumer*
Visita molto utile, Grazie - *The visit was very useful, thank you*
Complimenti per l'entusiasmo dei collaboratori -*Compliments for the enthusiasm of the staff*
Ottimo lavoro continuate così non dimenticando la salute e il benessere dei cittadini - *Very good work continue like that, do not forget the consumer health and welfare*
Spero che il vostro lavoro sia sempre premiato per la sua serietà e professionalità - *I hope that your work would always be appreciated for its professionalism and seriousness*
Rendere più "pubblico" ill vostro lavoro e la sua importanza.- *Make your work more available to public due to its importance*
Iniziativa interessante e tranquilizzante rispetto al terrorismo che a volte si accende sui contenitori alimentari - *Interesting initiative, it is reassuring in spite of the terrorism about food packaging that sometimes comes up*
Continuate a lavorare con coscienza perchè la sicurezza è un bene inestimabile.- *Continue working conscienciustly because the safety it is a inestimable good*
Mi sento più protetto e sicuro grazie al lavoro di questi ricercatori, che lavorano per la nostra sicurezza
*I feel more protected and safer thanks to these researchers' activities, who work for our safety*
Diffondere informazioni sulle confezioni come dato ulteriore per la sicurezza degli alimenti - *Spread the information about food packaging as an additional data for food safety*

## Annex 5 – supporting documents for phase 5 – questionnaires to stakeholders – list of respondents

| NO | MS | Inst. code | Institution | CODE |
|---|---|---|---|---|
| 1 | DE | INST | ISEGA | _ISEGA |
| 2 | UK | INST | Pira International | _PIRA |
| 3 | NL | NRL | Food and Consumer Product Safety Authority | _NRL NL |
| 4 | PO | NRL | Biotechnology school | _NRL PO |
| 5 | NL | MS CA | RIVM | _MSCA NL |
| 6 | DK | NRL | The Danish Institute for Veterinary and Food Research | _NRL DK |
| 7 | AU | NRL | Österreichische Agentur für Gesundheit und Ernährungssicherheit GmbH | _NRL AU |
| 8 | I | INST | INRAN: Istituto Nazionale di Ricerca per gli Alimenti e la Nutrizione | _INRAN |
| 9 | UK | MSCA | Food standard Agency, | _FSA UK |
| 10 | DE | INST | Klöckner Pentaplast GmbH & CO. KG. | _PENTAPLAST |
| 11 | EE | NRL | Central Laboratory of Chemistry | _NRL EE |
| 12 | CH | MSCA | Office fédéral de la santé publique | _MSCA CH |
| 13 | SK | NRL | National reference centre for food contact materials | _NRL SK |
| 14 | PL | NRL | Laboratory Department of Food and Consumer Articles | _NRL PL |
| 15 | NL | TNO | TNO Quality of life | _TNO NL |
| 16 | DE | IND | Novelis | _NOVELIS |
| 17 | CY | NRL | State general Laboratory | _NRL CY |
| 18 | UK | NRL | Central Science Laboratory, Sand Hutton, York | _NRL UK |
| | | | Association for consumer Information | _VKI AU |
| 19 | | | Competent Authority | |
| 20 | AU | | Airbeiterkammer Wien, konsumentenpolitische Abteilung | _MSCA AU |
| 21 | | | | |
| | | | Office Technology and innovation GmbH | _Ofi AU |
| 22 | SI | NRL | Institute of Pubblic Health of the Republic of Slovenia | _NRL SL |

European Commission

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## Abstract

Between March 2003 and September 2006 the FOODMIGROSURE project, contract number QLK-CT2002-2390, was carried out by 9 European project partners with the intention to develop an 'into-food' migration model tool which should enable prediction of mass transfer of constituents from plastics food contact materials into foodstuffs in support of calculations/estimations of the exposure of consumers towards food packaging constituents. A further objective was to investigate the social acceptance of migration modelling versus chemical measurements, and its implications for exposure estimation. This was achieved by several approaches including focus group (as qualitative approach), and questionnaires with a large polling bas as quantitative approach from citizens. A test trial was run on consumer associations and the experiment was then conducted on citizens during a JRC Open Day. Questionnaires and comments were colleted for 700 units which represented about 1400 visitors to the food contact activities. In the last phase, a more specific technical questionnaire was directed to end-user of modelling, which was mailed to a variety of stakeholders such as National Reference Laboratories, commercial laboratories, industries, EFSA, CEN members etc.

Globally, people in the overwhelming majority -both for the questionnaire approach and for the focus group approach- felt reassured regarding the safety of packaging simply from the fact that they did not previously know that such research and controls existed. Many citizens also clearly expressed the wish to have this type of research much more visible at the level of both consumer associations and consumers themselves. The responses were echoing quite interestingly between the different approaches directed at consumers/citizens. Although obtained by completely different methodologies, both focus groups and quantitative citizen polling questionnaires showed many similarities even in the specifics. There is a fundamental trust from the public in the scientists to distinguish and understand safety issues. The consumer wants sincerely to be approached and informed by scientists for this reason and is also ready to favour new approaches such as migration modelling if it can be an additional tool for better consumer protection. The benefits of packaging are recognised, and the presence of migrants is considered similarly to the presence of food additives in foods. Modelling is viewed as a additional helping tool to assist the scientist as first and foremost raison d'être, and was found to have its strongest value as pointing the worst cases that could occur. The consumers or citizens made no mention of environmental or worker health effects benefits. However, the consumer especially in the context of the focus group remarked justly that one needs to be sure that at the root for use of these models are experimental data which demonstrate the applicability of the model.

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